Registration of 'Alkabo' Durum Wheat

'Alkabo' (Reg. no. CV-1008, PI 642020), 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. Alkabo is the name of a former community in northwestern Divide County in western North Dakota. The Alkabo name comes from the alkali-gumbo soil common to the area. Alkabo was released based on its high grain yield, test weight, and quality.

Alkabo was tested as the experimental line D96604 and was selected from the cross D901247/D89263 made in 1992. The parent D901247 was derived from the cross D81154/'Renville’ (PI 510696)/LDN(Dic-5B). The pedigree of D81154 is PI19571/’Ward’(CI 15892). LDN(Dic-5B) is a substitution line of ‘Langdon’ (CI 13165) with chromosome 5B of *Triticum dicoccoides* accession FA-15-3 (Joppa and Cantrell, 1990). D89263 was derived from the cross ‘Fjord’/D8194. D8194 was derived from the cross D7690/’Vic’ (CI 17789). The pedigree of D7690 is D68111/’Rugby’ (CI 17284)/’Crosby’ (CI 17282). D68111 was derived from the cross D65150/’Leeds’ (CI 13768). The cross of D65150 is Pi/TM/2*Sc/3ZB/’Wells’ (CI 1333). Alkabo was developed using the pedigree breeding method and was bulked in the F5 generation as an F4-derived line in 1996. Six-thousand F4;13 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. Alkabo 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 ‘Pierce’ (Elias et al., 2004) and 1 d earlier than ‘Mountrail’ (Elias et al., 2000b). Alkabo has an average plant height of 85 cm, which is 5 cm shorter than Ben (Elias and Miller, 1998) and 12 cm taller than the semidwarf cultivar Plaza (Elias et al., 2001b). The culm of Alkabo is white and the peduncle is erect. Alkabo 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, long, 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 medium.

Based on 49 location-years of testing in the Uniform Regional Durum Nursery (URDN) from 2000 to 2004, the mean grain yield of Alkabo (3951 kg ha⁻¹) was higher than Ben (3729 kg ha⁻¹), ‘Maier’ (3689 kg ha⁻¹) (Elias et al., 2000a), Mountrail (3917 kg ha⁻¹) and Pierce (3843 kg ha⁻¹). In those same trials, Alkabo had a 774.1 kg m⁻³ grain volume weight compared to 761.2 kg m⁻³ of Maier and 779.2 kg m⁻³ of ‘Lebsock’ (Elias et al., 2001a). Alkabo had a 37.4 mg kernel weight compared to 35.1 mg of Maier and 39.1 mg of Ben. Based on 28 location-years in the North Dakota Research Extension Centers’ varietal trials from 2000 to 2004, Alkabo had higher grain yield (3702 kg ha⁻¹) than, Ben (3501 kg ha⁻¹), Maier (3447 kg ha⁻¹), Mountrail (3595 kg ha⁻¹) and Pierce (3561 kg ha⁻¹). In those same trials, Alkabo had a 784.4 kg m⁻³ grain volume weight compared to 775.4 kg m⁻³ of Maier and 788.3 kg m⁻³ of Lebsock.

Grain samples from quality drill strips grown at 19 site-years (2001 to 2003) were tested for durum wheat quality at North Dakota State University (NDSU). The semolina extraction rate of Alkabo was 64.4% on the Buhler-Miag laboratory mill at the Department of Cereal and Food Sciences, NDSU compared to 64.4% of Mountrail, 65.1% of Ben, and 65.3% of Lebsock. Alkabo has strong gluten mixing characteristics (classification: 6.5) as estimated by mixograph, compared to 7.2 of Pierce and 5.2 of Mountrail. Semolina protein of Alkabo was 136 g kg⁻¹ compared to 137 g kg⁻¹ of Lebsock and Mountrail. Pasta produced from Alkabo has a color score of 9.3 compared to 9.1 of Lebsock and 8.9 of Mountrail.
Alkabo was evaluated at the USDA-ARS, Northern Crop Science Laboratory, Fargo, ND for reaction to wheat stem rust (caused by *Puccinia graminis* Pers.:Pers. f. sp. *tritici* Eriks. & E. Henn) and was found to be resistant to pathotypes Pgt-QCCJ, -QTHJ, -RTQQ, -TMLK, -TPMK, and -HPHJ. Alkabo has exhibited adult plant resistance (reaction type 5R to 10R) to leaf rust (caused by *P. triticina* Eriks.) similar to Maier and Lebsock when evaluated in the URDN at Langdon, ND from 2000 to 2004. on a scale of 0 to 9 where 0 is resistant and 9 susceptible, Alkabo had average score of 4.5 in field reaction to tan spot [caused by *Pyrenophora tritici-repentis* (Died.) Drechs] compared to 4.3 and 4.7 of Maier and Mountrail. Alkabo has 22% disease severity to Fusarium head blight [caused by *Fusarium graminearum* Schwabe; teleomorph *Gibberella zeae* (Schweinitz) Petch] compared to 44% and 47% of Maier and Mountrail, respectively.

Breeder seed of Alkabo will be maintained by the Seed Stocks Project, Agricultural Experiment Station, North Dakota State Univ., Fargo, ND 58105-5051. Alkabo is protected under The U.S. Plant Variety Protection Act for Foundation, Registered, and Certified seed classes (PVP Certificate no. 200600105). 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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