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Table 1. Plant Introduction (PI) numbers, experimental line designations, and pedigrees of 19 spring waxy wheats.

PI no.	Experimental line designation	Pedigree
619354	99ID388	Kanto107/MN2540/3/BaiHuo5/K94H115//IDO469
619355	99ID389	Kanto107/MN2540/3/BaiHuo5/K94H115//IDO469
619356	99ID435	BaiHuo/L910097//Kanto107/3/Kanto107/Yanshi9
619357	99ID450	BaiHuo3/Cimarron//MN91227/3/Kanto107
619359	99ID477	BaiHuo/Chris//Kanto107
619360	99ID484	BaiHuo/L910097//Kanto107/3/BaiHuo3/Cimarron//MN91227
619361	99ID490	BaiHuo/Kanto107//Express
619362	99ID496	BaiHuo/Kanto107//Express
619363	99ID498	BaiHuo/Kanto107//Express
619365	99ID516	KY87C-42-8-5/Collin//ACMajestic/3/Kanto107/BaiHuo
619366	99ID520	KY87C-42-8-5/Collin//ACMajestic/3/Kanto107/BaiHuo
619367	99ID524	KY87C-42-8-5/Collin//ACMajestic/3/Kanto107/BaiHuo
619368	99ID529	KY87C-42-8-5/Collin//ACMajestic/3/Kanto107/BaiHuo
619369	99ID536	KY87C-42-8-5/Collin//ACMajestic/3/Kanto107/BaiHuo
619371	99ID548	Penawawa/NE92608//BaiHuo/3/BaiHuo4/Kanto107/A92-3327/Kanto107
619372	99ID554	Kanto107/BaiHuo//BaiHuo/Russ
619373	99ID569	BaiHuo/Kanto107//ACMajestic
619374	99ID590	BaiHuo/ACMajestic//Kanto107/MN2540
619375	99ID594	BaiHuo/Gunnar//Kanto107/Penawawa

Table 2. Mean grain yield, grain hardness class, and grain color characteristics of 19 waxy spring wheats.

				Postulated resistance genes†	
Line	Grain yield	Grain hardness class	Grain color	leaf rust	stem rust
	kg/ha				
619354	2257	hard	red	+	none
619355	2984	hard	red	none	none
619356	2660	hard	red	14a, +	10 or 17
619357	2352	soft	red	+	none
619359	2611	hard	red	16, +	none
619360	2076	hard	red	none	none
619361	3228	soft	red/white	1, +	none
619362	3606	hard	red	+	none
619363	2828	hard	red	none	none
619365	2829	hard	red	9, +	10 or 17
619366	3104	hard	red/white	+	36
619367	2633	hard	red/white	+	10 or 17
619368	3443	hard	red/white	9, +	10 or 17
619369	2955	hard	red	+	none
619371	2960	hard	red	none	none
619372	2588	hard	red	16, +	none
619373	2682	hard	red	+	none
619374	2897	hard	red	+	10 or 17
619375	3299	soft	red	+	none

† + designates presence of unknown gene postulated.

(caused by *Puccinia recondita* Roberge ex Desmaz.), the following resistance genes are postulated as being present in the respective waxy lines: *Lr1*, PI 619361; *Lr16*, PI 619372, PI 619359; *Lr14a*, PI 619356; *Lr9*. PI 619368, PI 619365. Unidentified additional leaf rust resistance genes are speculated to occur in all lines with the exception of PI 619363, PI 619360, PI 619371, and PI 619355. These last four lines are susceptible to current leaf rust races. Resistance genes to current races of stem rust (caused by *Puccinia graminis* Pers.: Pers.) occur in PI 619356, PI 619367, PI 619388, PI 619374, and PI 619365 (*SR10* or *Sr17*). Resistance gene *Sr36* was found in PI 619366. The remaining lines are susceptible to current races of stem rust.

Seed of all lines has been deposited in the USDA National Small Grains Collection, Aberdeen, ID. Small quantities of seed may be obtained from R. Graybosch, USDA-ARS, University of Nebraska, Lincoln, NE 68583. It is requested that the source of this material be acknowledged in future usage by wheat breeding and genetics programs.

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Registration of N96L9970 Greenbug Resistant Wheat

'N96L9970' (Reg. no. GP-747, PI 619231) is a hard red winter wheat (*Triticum aestivum* L.) germplasm line developed cooperatively by the USDA, ARS, and the Nebraska Agricul-

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tural Experiment Station, and was released in June 2002. The pedigree of N96L9970 is GRS1201/'TAM 202'. GRS1201 carries resistance to multiple races of greenbug (*Schizaphis graminum* Rondani) along with a 1AL.1RS wheat-rye (*Secale cereale* L.) chromosomal translocation originally produced from an irradiated alien chromosome substitution plant derived from a wheat × rye hybrid (short wheat selection/'Scout' [TX69A345-2]//'Insave' rye/3/'TAM W-101') (Porter et al., 1993). TAM 202 (described as an outcross between an unknown parent and 'Siouxland' (PI 483469) carries a different 1AL.1RS translocation (Worrall et al., 1995; Graybosch et al., 1999). The greenbug resistance (*Gb6*) of N96L9970 is located on the 1AL.1RS translocation inherited from GRS1201.

N96L9970 was derived as follows. The cross GRS1201/TAM 202 was made in the greenhouse at the University of Nebraska in the spring of 1992; F_1 seed was fall-sown at Yuma, AZ, in 1992. In 1993, an F_2 population was grown in the greenhouse at Lincoln. F_3 seed was harvested from each F_2 plant separately. For greenbug resistance screening, rows of 25 to 32 F_3 seed, plus resistant and susceptible check rows, were planted in flats. The flats were watered and placed in a growth chamber having a photoperiod of 13 h of light at 22°C and 11 h of dark at 18°C. When plants reached a height of approximately 1 cm, flats were infested so that each plant received approximately 10 to 20 greenbugs. Seven days after infestation, the plants were clipped to a height of 10 to 13 cm, and rated when susceptible check plants were damaged enough to distinguish them easily from resistant check plants (13–14 d after infestation). Susceptible plants were chlorotic and stunted in height. Greenbug biotype G was used to verify the presence of *Gb6*, and to differentiate *Gb6* from the 'Amigo' (PI 578213) derived (*Gb2*) greenbug resistance. *Gb6* conditions resistance to greenbug biotypes B, C, E, G, I, and K (Porter et al., 1993). F_3 seed of the all lines was planted at Yuma, in the fall of 1994; the F_4 generation was seeded at Lincoln in 1995. N96L9970 was selected as an $F_{2:4}$ line, scored as resistant to greenbug biotype G in the F_3 generation. In 1998, N96L9970 was entered in the USDA-ARS Hard Winter Wheat Regional Germplasm Observation Nursery (http://www.ianr.unl.edu/arslincoln/wheat/98RGON.pdf; verified 13 February 2004). N96L9970 again was scored as resistant after all lines in this nursery were tested against greenbug biotype E.

N96L9970 primarily was released because of significantly better agronomic performance than GRS1201, the only previously released source of resistance to greenbug biotypes B, C, E, G, I, and K. In six (five in Nebraska, one in Texas) Great Plains production environments over the 1997 and 1998 harvest years, N96L9970 averaged 3364 kg ha^{-1}, significantly higher than GRS1201 (2550 kg ha^{-1}). In the same environments, the check cultivars Arapahoe (PI 518591), TAM 202 and Siouxland averaged 3743, 3790, and 3425 kg ha^{-1}, respectively. N96L9970 was entered in the USDA-ARS Western Plains Regional Performance Nursery (WPRPN) in 1999 and 2000. In eight production environments in 1999, N96L9970 averaged 3817 kg ha^{-1}. In the same environments, check cultivars 'Trego' (PI 612576), Arapahoe, and 'Prowers' (PI 605389) averaged 3555, 3633, and 3418 kg ha^{-1} respectively. In the 2000 WPRPN (seven locations), N96L9970 averaged 2714 kg ha^{-1}, as opposed to 2911, 2497, and 2126 kg ha^{-1} for Trego, Arapahoe, and Prowers, respectively. Grain volume weight of N96L9970 averaged 69.3 kg hL^{-1}; Trego, Arapahoe, and Prowers averaged 75.8, 73.2, and 71.9 kg hL^{-1}, respectively.

Bread making properties of N96L9970 have similarities to those of both GRS1201 and TAM202. Respective mean (from three 1997 locations) quality traits of the GRS1201, N96L9970, and TAM202 were: grain hardness, 62.3, 62.7, and 66.0 hardness units; grain protein content, 134, 127, and 124 g kg^{-1}; Mixograph time, 3.0, 4.2, and 5.1 min; Mixograph tolerance 9.4, 11.4, and 12.1 mm (width of mixogram at 2 min past peak time); and loaf volume, 942, 923, and 938 mL.

N96L9970 is susceptible to prevalent races of leaf and stem rust (caused by *Puccinia triticina* Eriks. and by *Puccinia graminis* Pers.: Pers., respectively) but shows some resistance to *Soil-borne wheat mosaic virus* (SBWMV). N96L9970 is moderately tolerant of acid soils and has winter-hardiness similar to that of 'TAM 107' (PI 495594). It is susceptible to Russian wheat aphid (*Diuraphis noxia* Mordvilko). Plant height is similar to Trego, and N96L9970 arrives at heading approximately 1 d earlier.

Seed of N96L9970 has been deposited in the USDA National Small Grains Collection, Aberdeen, ID. Small quantities of seed may be obtained from R. Graybosch, USDA-ARS, University of Nebraska, Lincoln, NE 68583. It is requested that the source of this material be acknowledged in future usage by wheat breeding and genetics programs.

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Registration of NE-1 Proso Millet Germplasm

NE-1 (Reg. no. GP-88, PI 583348) is a white-seeded proso millet *(Panicum miliaceum* L.) developed by the Nebraska Agricultural Experiment Station. It was released for seed production in February 1995.

NE-1 was selected from the cross NE830141/NE83019. The expanded pedigree is Minn 402/2*'Dawn'//'Panhandle'/2*Dawn/3/Minn 402//Dawn/Panhandle. The cross was made, and F_2 seed was produced in the greenhouse during the winter of 1985–1986. NE-1 is an increase of an F_4 line selected in 1988 and tested as NE860203. NE-1 was not released as a cultivar because of its small seed size. It has potential as a germplasm because of high yield potential, lodging tolerance, high grain volume weight, and mid-season maturity.

NE-1 has a white seed coat (lemma and palea) and a compactum (closed) type panicle. The foliage is green in color and is similar to 'Sunup' (Nelson, 1990).

NE-1 has been tested in Nebraska yield nurseries since 1988 and in regional trials from 1991 to 1998. In regional trials, average grain yields were similar to Sunup, 'Sunrise' (Baltensperger et al., 1997), 'Huntsman' (Baltensperger et al., 1995b), 'Earlybird' (Baltensperger et al., 1995a) and 'Rise' (Nelson, 1984), and it yielded 24 and 18% greater than Panhandle