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WHEAT CULTIVARS FOR CALIFORNIA

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The following are descriptions of wheat cultivars evaluated in California from 1980 to 2011. The descriptions are based on published cultivar releases and data from the UC Regional Cereal Evaluation Tests conducted each year throughout California. Yield performance data for most of the cultivars can be found in University of California, Davis, Agronomy Progress Reports (No.'s 114, 118, 128, 144, 155, 168, 180, 201, 209, 217, 223, 229, 233, 236, 244, 249, 254, 259, 262, 265, 272, 276, 279, 286, 288, 290, 293, 295, 296, 301, 303, and 304 for 1980-2011, respectively). Reports #262 through #304 also can be seen at http://smallgrains.ucdavis.edu.

CURRENT CULTIVARS
HARD RED SPRING WHEAT

BULLSEYE

Bullseye is a hard red spring wheat. It was released by AgriPro of Syngenta Cereals in 2009. It was selected from the cross Klein Dragon/3/Buck Charrua//Buck Patacon/Curaco. Its experimental designation was B02-0081. It is a high yielding white chaffed line with very good test weight and medium maturity (heads ½ day later than Hank). It has short semidwarf height and very good straw strength. It is best adapted to higher rainfall dryland production in eastern Washington, west-central Idaho and northeastern Oregon and irrigated production in the basin of Washington and southern Idaho. Juvenile growth habit is erect. Plant color at boot stage is dark green. Auricle anthocyanin is very pronounced deep purple and auricle hairs are present. Flag leaf at boot stage is recurved and twisted. Waxy bloom is present on the head, stem and flag leaf sheath. Head shape is tapering and heads are awned. Glumes are glabrous, long in length and wide in width, with oblique shoulders and acuminate beaks. Seed shape is ovate. Brush hairs are short in length and occupy a medium area of the seed. Seed cheeks are angular. Seed crease depth is middeep and width is midwide. Embryos are large in size. At the time of release it was moderately resistant to predominant races of stripe rust, had good field tolerance to Fusarium head scab and was resistant to a Kansas population of Hessian fly (but susceptible to Hessian fly biotype L.). It subsequently became susceptible to stripe rust. It was evaluated in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2008-present for spring planting in the intermountain region of northern California. *(Washington Crop Improvement Association website: http://washingtoncrop.com/seed/varieties.asp*)

CABERNET

Cabernet is a hard red spring wheat. It was released by Syngenta Cereals in 2007. Its experimental designation was 95WV10616. It is adapted to irrigated and higher rainfall areas of the Pacific Northwest. It has erect juvenile plant growth. The plant color at boot is green and the flag leaf is recurved, twisted and waxy. Its maturity (medium) and plant height are very similar to Express. It has god straw strength. It has yellow anthers, green heads at flowering and tan chaffed heads at maturity. Seed is ovate, hard, red, with rounded cheeks and medium uncollared brush. It is moderately resistant to powdery mildew and moderately susceptible to stripe rust. It was evaluated in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-present for spring planting in the intermountain region of northern California. *(Washington Crop Improvement Association website: http://washingtoncrop.com/seed/varieties.asp*)

CAL ROJO

Cal Rojo is hard red spring wheat. It was released by Resource Seeds, Inc. in 2006. It was selected from the cross CMT1171-4//Pfau /Veery #5/3/Bonus. Its experimental designation was RSI 00WB80404. Cal Rojo is medium-early maturing (3 days earlier than Summit) and has excellent straw strength. Plant height is shorter than Blanca Grande by 12 cm and Summit by 8 cm. Foliage is blue-green at boot stage; the flag-leaf is erect and twisted. The stem has a waxy bloom, but no anthocyanin. The last internode of the stem is hairy, and the peduncle is erect. The stem has four nodes, and the internodes are hollow. The spikes are awned, inclined, mid-dense and tapering in shape, with tan

glumes that are long and wide, having shoulders that are narrow and elevated, and an acuminate beak. Seed is hard, red, elliptical, with a rounded cheek and medium brush, a crease that is narrow and shallow, and midsize germ. At the time of release it was resistant to stripe rust, leaf rust, and powdery mildew, moderately resistant to Septoria tritici leaf blotch, and moderately susceptible to BYD. It was evaluated as Entry 1478 in the UC Regional Cereal Testing program from 2005-present for late fall planting in the Central Valley and surrounding areas, the south-central coast, and the southern desert regions of California.

HANK

Hank is a hard red spring wheat. It was released by Western Plant Breeders (Westbred LLC) in 2000. It was selected from the cross Westbred 926/Westbred 936. It has medium-early maturity, averages 38 inches is plant height, and has excellent straw strength. It has very good milling and baking characteristics. At the time of release it was resistant to stripe rust, leaf rust, and powdery mildew and tolerant to Hessian fly. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1229 in the UC Regional Cereal Testing program from 1999-2006 and in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-2010 for spring planting in the intermountain region of northern California..

JOAQUIN

Joaquin is a hard red spring wheat. It was released by Westbred LLC in 2006. It was selected from the cross Eldon/YU994-199. Its experimental designation was YU999-178. It has medium-early maturity, averages 40 inches in plant height (the same as Anza and 3 inches taller than Yecora Rojo) and has fair straw strength. At the time of release it was moderately resistant to stripe rust, moderately susceptible to leaf rust, and susceptible to Septoria tritici leaf blotch and BYD. It subsequently became susceptible to stripe rust and powdery mildew. It was evaluated as Entry 1424 in the UC Regional Cereal Testing program from 2004-2011 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

KELSE

Kelse is a hard red spring wheat. It was developed by the Agricultural Research Center of Washington State University in cooperation with the AES's of the University of Idaho and Oregon State University, and USDA-ARS. It was released in 2009. It was derived from the cross WestBred 906R//PI520542//Scholar. Its experimental designations were WA007954, H0100092, and HR98036. It was released based on its resistance to the Hessian fly, high-temperature, adult-plant resistance to stripe rust, high grain protein content, superior baking quality, and grain yield potential in the intermediate to high rainfall, non-irrigated wheat production regions of Washington. Kelse is an intermediate height, semidwarf with lax, tapering, erect curvature inflorescence with tan awns and glumes that are long in length, wide in width and have medium, oblique shoulders, and narrow, acuminate beaks. It has oval kernels that are red, hard, and vitreous. Seed has a large germ with a medium depth crease, angular cheeks and a short, non-collared brush. It lacks anthocyanin pigmentation in the coleoptile, displays a semi-erect juvenile plant growth habit, the flag leaf is green in color, recurved, twisted, and waxy at Feekes growth stage 10.0. The stem has three nodes, lacks anthocyanin pigmentation, a waxy bloom is present, the last internode of the rachis is semi-solid, the auricle is pigmented, pubescence is absent, and the peduncle is erect. Kelse had medium maturity and heads about 3 days later than Hank, and 5 days later than WestBred 926 and Tara 2002. Plant height (average 80 cm) is taller then WestBred 926 and Hank, and equal to Tara 2002. Lodging when grown under irrigation is similar to Hank and lower than WestBred 926 and Tara 2002. At the time of release it was moderately resistant to powdery mildew and moderately susceptible to stripe rust. It subsequently became susceptible to stripe rust. It was evaluated in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2008-present for spring planting in the intermountain region of northern California. *(Washington Crop Improvement Association website: http://washingtoncrop.com/seed/varieties.asp*)

LARIAT

Lariat is a hard red spring wheat. It was released by Resource Seeds, Inc in 2007. It was selected from the cross Cleo/2Inia//W444/3/DWL5046/2*Celaya/4/UCSR/PB775/5/Stander. Its experimental designation was RSI 02W50076R. It has medium maturity, averages about 38 inches in plant height, and has excellent straw strength. At the time of release it was resistant to stripe rust, leaf rust, Septoria tritici leaf blotch and powdery mildew, and moderately resistant to BYD. It was evaluated as Entry 1555 in the UC Regional Cereal Testing program from 2007-2010 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

LASSIK
Lassik is a hard red spring wheat. It was developed by the University of California, Davis and released in 2007. Lassik was derived from the University of California HRS cultivar Anza. Three independent backcrossing programs were used to introgress several genes into Anza that were then combined into Lassik. The three backcrossing programs were as follows: **Madsen/6*Anza** to introgress the 2NS-2AS chromosome translocation from *Ae. ventricosum* carrying leaf rust resistance gene *Lr37*, stripe rust resistance gene *Yr17*, and stem rust resistance gene *Sr38*; **Glupro-GPC/6*Anza** to introgress the high grain protein content gene *Gpc-B1* and the stripe rust resistance gene *Yr36*; and **Glupro-Glutenins/6*Anza** to improve Anza gluten strength by replacing two high molecular weight glutenin (HMWG) alleles known to be associated with weak gluten with the *Glu-A1* '1' allele and the *Glu-D1* '5+10' allele from Glupro. It has medium late maturity, averages about 37 inches in plant height, and has fair straw strength. At the time of release Lassik was resistant to stripe rust, leaf rust and powdery mildew, and moderately resistant to Septoria tritici leaf blotch and BYD. It also was resistant to the root-knot nematode due to the presence of the 2NS translocation from *Ae. Ventricosum.* It subsequently became moderately susceptible to Septoria tritici leaf blotch and susceptible to leaf rust. It was evaluated as Entry 1495 in the UC Regional Cereal Testing program from 2006-present for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California and in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program in 2008 and from 2010-2011 for spring planting in the intermountain region of northern California.

MALBEC
Malbec is a hard red spring wheat. It was developed by Resource Seeds Inc. and released in 2010. Its experimental designation was RSI 50603. It is adapted to the irrigated and higher rainfall areas of the Pacific Northwest. It has erect juvenile plant growth. The plant color at boot is green and the flag leaf is erect, twisted, and glossy. It has medium maturity (heading is 2 days earlier than Cabernet). Plant height is about 2 inches taller than Cabernet. It has awns, yellow anthers and tan chaffed heads at maturity. Seed is ovate, hard, red, with rounded cheeks and medium uncollared brush. It is susceptible to stripe rust. It was evaluated in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2010-present for spring planting in the intermountain region of northern California. *(Washington Crop Improvement Association website: http://washingtoncrop.com/seed/varieties.asp*)

MIKA
Mika is a hard red spring wheat. It was released by World Wide Wheat in 2006. It was selected from a male sterile facilitated recurrent selection population, MSFRS HRS Quality Population. Its experimental designation was WWW BR3677. It has medium late maturity, averages about 46 inches in plant height (6 inches taller than Anza and 9 inches taller than Yecora Rojo) and has poor straw strength (lodging susceptible). At the time of release it was resistant to stripe rust and powdery mildew, moderately resistant to leaf rust, moderately susceptible to BYD, and susceptible to Septoria tritici leaf blotch. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1340 in the UC Regional Cereal Testing program from 2002-2009 and from 2011-present for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

PR 1404
PR 1404 is a hard red spring wheat developed by Cebeco and released for the forage market by Barkley Seed Inc. and Westbred LLC in 2004. It was selected from the cross Melchior/Emu. Its experimental designation was Cebeco 1404. It is medium-late maturing (heads 4 days later than Express) with good straw strength. The plant is very erect through the boot stage. The spikes are awnletted, with the apical awnlettes being somewhat more prominent. It has the "stay green" trait. It should be harvested in dough stage as a green-chop forage or swathed and baled as hay. It has excellent winter forage and hay quality, but the quality of the grain is not readily acceptable in the milling and baking industry. At the time of release it was resistant to stripe rust and leaf rust, moderately resistant to Septoria tritici leaf blotch, and moderately susceptible to BYD. It was evaluated as Entry 1526 in the UC Regional Cereal Testing program from 2005-06 and in 2011 for fall-sowing in the Central Valley for forage/green chop for dairies.

REDWING
Redwing is a hard red spring wheat. It was released by Resource Seeds, Inc in 2008. It was selected from the cross CMT Synthetic/1065-3/3/UCSR/PB775//Express. Its experimental designation was RSI 01W20728. It has medium early maturity, averages about 36 inches in plant height, and has good straw strength. At the time of release it was resistant to stripe rust and leaf rust and moderately resistant to Septoria tritici leaf blotch and BYD. It subsequently became moderately resistant to stripe rust and moderately susceptible to powdery mildew. It was evaluated as Entry 1521 in the

UC Regional Cereal Testing program from 2006-present for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

SUMMIT 515
Summit 515 is a hard red spring wheat. It was developed by Syngenta Cereals (formerly Resource Seeds, Inc.) and released in 2011. Stripe rust resistance genes *Yr5* and *Yr15* were introduced by four backcross generations into the susceptible cultivar Summit and then combined using marker assisted selection at UC Davis (project supported by Research Seeds Inc.). Research Seed Inc. selected the best lines among $BC4F_2$ lines homozygous for the two genes. This cultivar is very similar to the original Summit but is resistant to prevalent races of the stripe rust pathogen present in California. It has medium early maturity and good straw strength. It is resistant to stripe rust and leaf rust, moderately susceptible to BYD, and susceptible to Septoria tritici leaf blotch and powdery mildew. It was evaluated as Entry 1658 in the UC Regional Cereal Testing program from 2010-present for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

SY 314
SY 314 is a hard red spring wheat. It was developed by Syngenta Cereals (formerly Resource Seeds, Inc.) and released in 2011. It was selected from the cross Summit/8/1171PFVBNS/7/U564C4CPXKSRCB12A. Its experimental designation was 05W90314. It averages about 35 inches in plant height and has good straw strength. At the time of release it was resistant to stripe rust, leaf rust, and powdery mildew, and moderately resistant to Septoria tritici leaf blotch and BYD. It was evaluated as Entry 1704 in the UC Regional Cereal Testing program from 2011-present for late fall planting in the Central Valley of California.

TRIPLE IV
Triple IV is a hard red spring forage wheat. It was released by Westbred LLC in 2005. It is early maturing (7-10 days earlier than Yecora Rojo) with poor straw strength. Spikes are awnless. It was developed as a fall-sown forage/green chop silage for dairies in the Central Valley. At the time of release it was moderately resistant to stripe rust, leaf rust, Septoria tritici leaf blotch and BYD. It subsequently became moderately susceptible to stripe rust and susceptible to leaf rust. It was evaluated as Entry 1550 in the UC Regional Cereal Testing program from 2007-present for late fall planting in rainfed sites in the Central Valley and surrounding areas of California and in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program in 2010 for spring planting in the intermountain region of northern California.

ULTRA
Ultra is a hard red spring wheat. It was released by Resource Seeds, Inc in 2006. It is intended for fall planting for forage production in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California. It has medium maturity, averages about 34 inches in plant height, and has good straw strength. Its juvenile growth is erect; its color at boot stage is yellow green, and its flag leaf at boot is recurved, twisted, and waxy. Auricles have anthocyanin but lack hair. Its anther color is yellow. Its stem does not have anthocyanin, but does have a waxy bloom, and the last internode of its rachis is hairy. The internodes are semi-solid, and the peduncle is erect. The spikes are awned, lax, tapering and inclined at maturity. Glumes are tan and of medium length and width. The shoulders of the glumes are narrow and apiculate, and the beaks are narrow and acuminate. Seed is hard, red, elliptical, and has a midsize germ. It has a rounded cheek and medium, non-collared brush. Its crease has a width that is 60% or less of the kernel width, and a depth that is 35% or less of the kernel. At the time of release it was resistant to stripe rust and leaf rust, moderately resistant to BYD, and moderately susceptible to Septoria tritici leaf blotch. It subsequently became moderately resistant to stripe rust and susceptible to powdery mildew. It was evaluated as Entry 1590 in the UC Regional Cereal Testing program in 2008 and 2011 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

WB-PATRON
WB-Patron is a hard red spring forage wheat. It was released by Monsanto Technology LLC in 2011. It was selected from the cross PR 1404 *2/Expresso. It contains the markers for stripe rust resistant genes Yr15 and Yr17. WB-Patron most resembles the variety PR 1404. It is an awnletted type and is targeted toward the wheat forage market. It averages about 39 inches in plant height, has good straw strength, and is medium maturing, 4 days earlier to heading than PR 1404. It is resistant to stripe rust and leaf rust, and moderately resistant to Septoria tritici leaf blotch. It is adapted to all areas where PR 1404 is grown which includes the Central Valley, surrounding areas, the south central coast and southern desert regions.

WB-ROCKLAND
WB-Rockland is a hard red spring wheat. It was released by Monsanto Technology LLC in 2010. It was selected from the cross Expresso/2*Solano. Its experimental designation was SJ908-247. It contains the markers for stripe rust resistant genes Yr15 and Yr17. It has exceptionally high grain protein content. WB-Rockland most resembles Solano. Plant height is about 35 inches (about 4 inches shorter than Expresso). It is a day length insensitive semidwarf with excellent straw strength and medium early maturity. Plant color at booting is green and the flag leaf is erect, twisted with wax present. Hairs are present on both the last rachis internode and the auricles. The spikes are white, oblong, lax erect and awned. The seeds are elliptical with rounded cheeks. At the time of release, it was resistant to stripe rust and leaf rust, moderately resistant to Septoria tritici blotch and BYD, and moderately susceptible to powdery mildew. It subsequently became susceptible to BYD. It was evaluated as Entry 1650 in the UC Regional Cereal Testing program from 2010-present for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California and in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2010-present for spring planting in the intermountain region of northern California.

YECORA ROJO
Yecora Rojo is a hard red spring wheat released by the California AES in 1974. It was developed by the International Maize and Wheat Improvement Center (CIMMYT) in cooperation with the Mexican Ministry of Agriculture (INIA). It was introduced to California and tested with purification, but without further selection. It derives from a single red-grained plant selected from the cross Ciano 67//Sonora 64/Klein Rendidor/3/ II-8156, known as the Bluebird family of cultivars. Its experimental designations were D7188 and C740001. Yecora Rojo has a spring growth habit and short-stature (averages 35 inches in plant height) with fair lodging resistance and medium-early maturity. It has excellent milling and bread wheat quality characteristics. Spikes are fusiform, mid-dense, white-glumed, moderately lax with long spreading awns, and curved at maturity. Awns are white and 10-12 cm long. Glumes are white, long and wide, with long glume awns. Shoulders are square. Beaks are acuminate. Kernels are red, hard, long, and ovate. Creases are shallow and mid-wide. Cheeks are rounded. Brushes are long. Collars are lacking. Yecora Rojo is susceptible to Septoria tritici leaf blotch, stripe rust, leaf rust, and powdery mildew, moderately susceptible to BYD, and resistant to Hessian fly. It was evaluated as Entry 112 in the UC Regional Cereal Testing program from 1980-present for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas, and for spring planting in the intermountain region of northern California and in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program in 2010 for spring planting in the intermountain region of northern California. *Crop Science 25:1130 (1985)*

CURRENT CULTIVARS
HARD WHITE WHEAT

BLANCA FUERTE
Blanca Fuerte is a hard white spring wheat. It was released by Resource Seeds, Inc. in 2006. It was selected from the cross Serra/4/VS73.600/MRL/3/Bow//YR/TRF/5/RSI5/6/PH989-188/1065-3. Its experimental designation was RSI 02W50274. It has medium maturity, averages about 38 inches in plant height (one inch taller than Blanca Grande) and has good straw strength. It is very similar to Blanca Grande in exhibiting erect juvenile growth habit. It has a blue-green plant color. The flag leaf at booting is recurved and twisted with wax present. Seed has an oval shape. At the time of release it was resistant to stripe rust and leaf rust, and moderately resistant to Septoria tritici leaf blotch and BYD. It subsequently became moderately susceptible to Septoria tritici leaf blotch and powdery mildew. It was evaluated as Entry 1523 in the UC Regional Cereal Testing program from 2006-present for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

BLANCA GRANDE 515
Blanca Grande 515 is a hard white spring wheat. It was released by Resource Seeds, Inc in 2010. The stripe rust resistance genes Yr5 and Yr15 were introduced by four backcross generations into the susceptible cultivar Blanca Grande and then combined using marker assisted selection at UC Davis (project supported by Resource Seeds Inc.). Resource Seeds Inc. selected the best lines among $BC4F_2$ lines homozygous for the two genes. This cultivar is very

similar to the original Blanca Grande but is resistant to prevalent races of the stripe rust pathogen present in California. It has medium early maturity, averages about 40 inches in plant height, and has fair straw strength. At the time of release it was resistant to stripe rust and leaf rust, moderately resistant to BYD, and susceptible to Septoria tritici leaf blotch. It subsequently became moderately susceptible to BYD and susceptible to powdery mildew. It was evaluated as Entry 1657 in the UC Regional Cereal Testing program from 2010-present for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

BLANCA ROYALE

Blanca Royal is a hard white spring wheat. It was released by Resource Seeds, Inc. in 2007. It was selected from the cross Cleo/2Inia//W444/3/DWL5046/2*Celaya/4/UCSR/PB775/5/Stander. Its experimental designation was RSI 02W50076-W. It has medium early maturity, averages about 38 inches in plant height (one inch taller than Blanca Grande) and has good straw strength. At the time of release it was resistant to stripe rust and leaf rust and moderately resistant to Septoria tritici leaf blotch, powdery mildew, and BYD. It was evaluated as Entry 1522 in the UC Regional Cereal Testing program from 2006-present for late fall planting in the Central Valley, surrounding areas, and the south-central coast region of California.

CLEAR WHITE

Clear White is a hard white spring wheat. It was developed by the University of California, Davis and released in 2005. It was selected from the cross Anza//D6301/NAI60/3/Yecora Rojo/4/Klasic. Its experimental designations were UCD 990370078 and UC 1361. Clear White was selected for its good grain yield potential, resistance to stripe rust and leaf rust, and its excellent bread-making and Asian noodle quality. It has low levels of polyphenol oxidase enzyme (PPO), which prevents noodle discoloration. Clear White has an average plant height of 94 cm, similar to Blanca Grande (96 cm) and Plata (95 cm) and taller than Klasic (83 cm). It is medium maturing (heading 2 days later than Blanca Grande and Klasic) and has good straw strength. It has an erect growth habit with recurved flag leaf. It has mid-dense white spikes with long awns (9–11 mm). The glumes are large, wide, and acuminated with a rounded shoulder. The kernel is oval, white, with a long brush. At the time of release it was resistant to leaf rust, powdery mildew, and Septoria tritici leaf blotch, moderately resistant to BYD, and moderately susceptible to stripe rust. It subsequently became moderately resistant to leaf rust, moderately susceptible to BYD, and susceptible to Septoria tritici leaf blotch. It was evaluated as Entry 1361 in the UC Regional Cereal Testing program from 2002-2009 and from 2011-present for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California and in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program in 2008 and from 2010-present for spring planting in the intermountain region of northern California.. *Crop Science 45:2652 (2005)*

PATWIN

Patwin is a hard white spring wheat. It was developed by the University of California, Davis and released in 2006. It was selected from the cross Madsen/2*Express. Its experimental designations were UCD 03010/24 and UC 1419. It has short stature (average plant height is 38 in, similar to Blanca Grande and Clear White) and excellent straw strength. It is medium late maturing (flowers approximately 6 days later than Clear White and 10-12 days later than Blanca Grande). It has a 2NS/2AS translocation from *Ae.ventricosum* carrying leaf rust resistance gene *Lr37,* stripe rust resistance gene *Yr17,* and stem rust resistance gene *Sr38.* It has a semi-erect juvenile plant growth habit. Flag leaves are recurved and twisted. It has mid-dense, inclined strap shaped heads with white awns, and white glumes that are long and medium length with square shoulders and acuminate beaks. Kernels are oval, white, and hard. Seed has a midsize germ with a narrow crease, rounded cheeks, and a medium sized, non-collared brush. It contains the high molecular weight subunits 5+10 (*Glu-D1*). Patwin has high loaf volumes which are not significantly different from Blanca Grande but that are significantly larger than those observed for Clear White. All three cultivars have similar flour extraction rates. At the time of release it was resistant to stripe rust, leaf rust, and powdery mildew, moderately resistant to Septoria tritici leaf blotch, and susceptible to BYD. It subsequently became moderately resistant to leaf rust. It is resistant to the root-knot nematode due to the presence of the 2NS translocation from *Ae.Ventricosum*. It was evaluated as Entry 1419 in the UC Regional Cereal Testing program from 2004-present for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California and in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-2009 for spring planting in the intermountain region of northern California..

PATWIN 515

Patwin 515 is a hard white spring wheat. It was developed by the University of California, Davis. Foundation seed was produced in 2011/2012, with release planned for 2013. Stripe rust resistance genes *Yr5* and *Yr15* were introduced by five backcross generations into the UC Davis resistant cultivar Patwin (from the cross Madsen/2*Express) and then combined using marker assisted selection at UC Davis. This cultivar also has the *Aegilops ventricosa* 2NS translocation carrying resistance genes to stripe rust *Yr17*, leaf rust *Lr37*, stem rust *Sr38*, and root knot nematodes. Patwin 515 has very high yield potential in both the Sacramento and San Joaquin Valleys as well as excellent breadmaking quality (has one of the highest protein contents among current cultivars). It is very similar to the original Patwin, with medium-late maturity and excellent straw strength, but has additional sources of stripe rust resistance. It is resistant to stripe rust and leaf rust, moderately resistant to Septoria tritici leaf blotch and BYD, and moderately susceptible to powdery mildew. It was evaluated as Entry 1680 in the UC Regional Cereal Testing program from 2011-present for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California and in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2011-present for spring planting in the intermountain region of northern California.

WB-CRISTALLO

WB-Cristallo is a hard white spring wheat. It was released by Westbred LLC in 2009. It was selected from the cross Stander/Express//Plata. Its experimental designation was DA904-32W. It has medium maturity, averages about 37 inches in plant height (1 inch shorter than Blanca Grande), and has fair straw strength. It has an erect juvenile growth habit and a green plant color. The flag leaf is erect, twisted with wax present. The spikes are white, awned, oblong, dense and erect. The seed is elliptical. At the time of release it was resistant to stripe rust and moderately resistant to Septoria tritici leaf blotch. It also is moderately resistant to leaf rust, powdery mildew, and BYD. WB-Cristallo was evaluated as Entry 1548 in the UC Regional Cereal Testing program from 2007-present for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

WB-PALOMA

WB-Paloma is a hard white spring wheat. It was released by Monsanto Technology LLC in 2010. It was selected from the cross TA/Snow Crest//Waikea. Its experimental designation was BZ904-331WP. WB-Paloma has exceptionally good milling and baking properties. It has medium early maturity, averages about 35 inches in plant height (same as Joaquin) and has fair straw strength. It has erect juvenile growth habit. It has green plant color. The flag leaf is erect, twisted with wax present. The spikes are oblong, white, lax, erect and awned. The seed shape is elliptical with rounded cheeks. At the time of release it was resistant to powdery mildew and moderately resistant to stripe rust, leaf rust, Septoria tritici blotch, and BYD. It subsequently became susceptible to stripe rust, Septoria tritici leaf blotch, and BYD. It was evaluated as Entry 1605 in the UC Regional Cereal Testing program from 2008-present for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

WB-PERLA

WB-Perla is a hard white spring wheat. It was released by Monsanto Technology LLC in 2011. It was selected from the cross Joaquin*4/Expresso. It contains the molecular markers for stripe rust resistant genes Yr15 and Yr17. WB-Perla most resembles the cultivar Joaquin but has white seed. Baking quality is similar to Joaquin. It is a day length insensitive semidwarf, averages about 37 inches in plant height, and has good straw strength. It is medium-early in maturity. It is resistant to stripe rust and leaf rust, and susceptible to Septoria tritici leaf blotch. WB-Perla is adapted to late fall planting in the San Joaquin Valley and southern desert areas of California.

CURRENT CULTIVARS
DURUM WHEAT

CROWN

Crown is a durum wheat. It was released by World Wide Wheat in 1999. It was selected from a male-sterile facilitated recurrent selection population (WWW MSFRS Quality Pop). Its experimental designation was WWW D3117. It is awned, has medium maturity, averages about 36 inches in plant height, and has good straw strength. At the time of release it was resistant to stripe rust and leaf rust, moderately susceptible to Septoria tritici leaf blotch, and susceptible to BYD. It subsequently has become moderately resistant to stripe rust and moderately susceptible to powdery mildew. It was evaluated as Entry 1166 in the UC Regional Cereal Testing program from 1998-present for late

fall planting in the Central Valley and the Imperial Valley of California.

DESERT KING

Desert King is a durum wheat. It was released by the University of California AES in 2005. It was developed by the International Maize and Wheat Improvement Center (CIMMYT) in cooperation with the Mexican Ministry of Agriculture (INIA) and received for testing in California as the cross Inter-11. Its experimental designation was UCD 992050023. It has short stature (similar to Kronos and Kofa, averaging about 38 inches), good straw strength, and medium late maturity (6 days later to head than Kronos). It has a straight peduncle and dense spikes with long awns that turn black at maturity. Glumes are large, white, glabrous with wanting shoulders, short awns, and an acuminate beak. Seed is ovate with rounded cheeks and a long brush. It has good quality, similar to Kronos for protein level, alveograph W values, pasta color and firmness. At the time of release it was resistant to stripe rust, leaf rust, and Septoria tritici leaf blotch, moderately resistant to BYD, and susceptible to powdery mildew. It subsequently has become moderately resistant to stripe rust. It was evaluated as Entry 1375 in the UC Regional Cereal Testing program from 2002-present for late fall planting in the Central Valley and the Imperial Valley of California.

DESERT KING HP

Desert King HP (Desert King –High Protein**)** is a durum wheat. It was developed by the University of California, Davis and released in 2011. Marker assisted selection was used to introgress the linked genes *Yr36* for resistance to stripe rust and *Gpc-B1* which increases grain protein content by approximately 10% more than Desert King into Desert King (from the cross Inter-11). Its experimental designation was UCD 08201/18. It has very high yield potential and very good pasta quality. Maturity (medium late) and plant height (averages about 34 inches) are similar to Desert King. Desert King HP has good straw strength. Desert King HP is partially resistant to stripe rust so can be grown in the Sacramento and San Joaquin valleys. The introgression of the *Gpc-B1* results in levels of protein that are compatible with high quality durum. Desert King HP shows lower levels of black point than other durum cultivars. The objective of this cultivar is to extend northward the durum growing region in California. At the time of release it was resistant to stripe rust, leaf rust, Septoria tritici leaf blotch, and BYD, and moderately susceptible to powdery mildew. It was evaluated as Entry 1627 in the UC Regional Cereal Testing program in 2009 and from 2011-present for late fall planting in the Central Valley and the Imperial Valley of California.

DURAKING

Duraking is a durum wheat. It was developed by Farmers Marketing Corporation (now World Wide Wheat). It was released by World Wide Wheat in 1994. It was selected from a male-sterile facilitated recurrent selection population (MSFRS Quality Durum Pop). Its experimental designations were CONT D5456 and FMC 5456. It is awned, has medium maturity, averages about 39 inches in plant height and has good straw strength. At the time of release it was resistant to leaf rust and powdery mildew, moderately resistant to stripe rust, and moderately susceptible to Septoria tritici leaf blotch and BYD. It subsequently became moderately susceptible to stripe rust and susceptible to powdery mildew. It was evaluated as Entry 878 in the UC Regional Cereal Testing program from 1990-present for late fall planting in the Central Valley and the Imperial Valley of California.

FORTISSIMO

Fortissimo is a durum wheat. It was released by Resource Seeds, Inc in 2006. It was selected from the cross Vic/Leeds//Aldura/881. Its experimental designations were RSI 00WV50064 and RSI 64. It is awned, has medium late maturity, averages about 36 inches in plant height, and has good straw strength. At the time of release it was resistant to stripe rust, Septoria tritici leaf blotch and BYD, and moderately susceptible to powdery mildew. It was evaluated as Entry 1429 in the UC Regional Cereal Testing program from 2004-present for late fall planting in the Central Valley and the Imperial Valley of California.

HAVASU

Havasu is a durum wheat. It was released by WestBred LLC in 2005. It was selected from the cross Kofa///Mohawk//Express/Karl. Its experimental designation was WB PH896-21. It is awned, has medium early maturity, averages about 34 inches in plant height, and has fair straw strength. It is a low cadmium uptake durum. At the time of release it had less than 1⁄2 the cadmium uptake of other available durum wheat cultivars. It was evaluated as Entry 1479 in the UC Regional Cereal Testing program from 2005-present late fall planting in the Imperial Valley of California.

KRONOS
Kronos is a durum wheat. It was released by Arizona Plant Breeders in 1992. It was selected from a male-sterile facilitated recurrent selection population (APB MSFRS Pop). Its experimental designation was APB D03-21. It is awned, has medium early maturity, averages about 38 inches in plant height, and has poor straw strength. It has excellent quality. At the time of release it was resistant to leaf rust, moderately resistant to stripe rust and powdery mildew, and susceptible to Septoria tritici leaf blotch and BYD. It subsequently became susceptible to stripe rust and powdery mildew. It was evaluated as Entry 951 in the UC Regional Cereal Testing program from 1992-present for late fall planting in the Central Valley and the Imperial Valley of California.

MAESTRALE
Maestrale is a durum wheat. It was developed by AllStar Seed Company and released in 2004. It was selected from the cross Iride/Svevo. It has fair lodging resistance, good cold tolerance, high test weight, good gluten quality, and very high yellow index. It is medium maturing and medium height (averages about 39 inches in plant height), and has light brown awns. At the time of release it was resistant to leaf rust, powdery mildew and Septoria tritici leaf blotch, and moderately resistant to stripe rust and BYD. It was evaluated as Entry 1582 in the UC Regional Cereal Testing program from 2007-present for late fall planting in the Central Valley and the Imperial Valley of California.

NORMANNO
Normanno is a durum wheat. It was developed by AllStar Seed Company and released in 2004. It was selected from the cross Simeto/F22/L35. It has good lodging resistance, good cold tolerance, high test weight, very high protein content and yellow index, and extraordinary gluten quality. It is late maturing and medium short height (averages about about 36 inches), with good straw strength. Awns are brown. At the time of release it was resistant to leaf rust and powdery mildew and moderately susceptible to stripe rust and BYD. It was evaluated as Entry 1589 in the UC Regional Cereal Testing program from 2010-present for late fall planting in the Central Valley and the Imperial Valley of California.

ORITA
Orita is a durum wheat. It was released by WestBred LLC in 2001. It was selected from the cross PH 888-118-5/Westbred 881. Its experimental designation was YU 95-89. It is awned, has medium late maturity, averages about 38 inches in plant height, and has good straw strength. At the time of release it was resistant to leaf rust, Septoria tritici leaf blotch, and powdery mildew, moderately resistant to BYD, and moderately susceptible to stripe rust. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1215 in the UC Regional Cereal Testing program from 1999-present for late fall planting in the Central Valley and the Imperial Valley of California.

PLATINUM
Platinum is a durum wheat. It was released by World Wide Wheat in 1999. It was selected from a male-sterile facilitated recurrent selection population (WWW MSFRS Durum Quality Population). Its experimental designation was D8430. It is awned, has medium early maturity, averages about 34 inches in plant height, and has fair straw strength. At the time of release it was resistant to stripe rust, leaf rust, and Septoria tritici leaf blotch, moderately susceptible to BYD, and susceptible to powdery mildew. It was evaluated as Entry 1210 in the UC Regional Cereal Testing program from 1999-present for late fall planting in the Central Valley and the Imperial Valley of California.

Q-MAX
Q-Max is a durum wheat. It was released by World Wide Wheat in 2007. It was selected from a male-sterile facilitated recurrent selection population (MSFRS Desert Durum Quality Population). Its experimental designation was WWW D3117A. It is medium late maturing, averages about 40 inches in plant height and has good straw strength. At the time of release it was resistant to Septoria tritici leaf blotch, moderately resistant to stripe rust and BYD, and moderately susceptible to powdery mildew. It subsequently became moderately susceptible to BYD. It was evaluated as Entry 1473 in the UC Regional Cereal Testing program in 2005, 2007-2009, and 2011-present for late fall planting in the Central Valley and the Imperial Valley of California.

RSI 59
RSI 59 is a durum wheat. It was released by Resource Seeds, Inc. in 2007. It was selected from the cross Aldura/881//Mex75. Its experimental designation was RSI 00WV50059. It is awned, has medium late maturity, averages about 32 inches in plant height, and has good straw strength. At the time of release it was resistant to Septoria tritici leaf blotch and BYD, and moderately susceptible to stripe rust. It subsequently became moderately resistant to

BYD. It was evaluated as Entry 1430 in the UC Regional Cereal Testing program from 2004-present for late fall planting in the Central Valley and the Imperial Valley of California.

SARAGOLLA
Saragolla is a durum wheat. It was developed by AllStar Seed Company and released in 2004. It was selected from the cross Iride/Linea PSB 0114. It has good lodging resistance, good cold tolerance, high test weight, very high protein content and yellow index, excellent gluten quality, high quality seminola, and very high yield potential. It has white awns, medium late maturity, and medium plant height (averages about 36 inches). At the time of release it was resistant to leaf rust, powdery mildew and Septoria tritici leaf blotch, and moderately resistant to stripe rust and BYD. It subsequently became moderately resistant to powdery mildew and moderately susceptible to stripe rust. It was evaluated as Entry 1583 in the UC Regional Cereal Testing program from 2007-present for late fall planting in the Central Valley and the Imperial Valley of California.

TANGO
Tango is a durum wheat. It was developed by World Wide Wheat (W3) LLC and released in 2003. It originated as a single F_2 head selection out of W3's Male Sterile Facilitated Recurrent Selection Low Gluten Population group (MSFRS-LG). Its experimental designation was D8750. Tango has unique quality characteristics of low gluten and good color. It has average to above average yield potential under adequate and/or moderate moisture conditions. It is medium early maturing, similar to Platinum but 2 days later than Kronos, and averages about 36 inches in plant height, 3 inches taller than Kronos and Fortissimo. It has excellent straw strength. At the time of release, Tango was resistant to BYD, black point, and moderately resistant to stripe rust. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1674 in the UC Regional Cereal Testing program in 2010 for late fall planting in the Central Valley and the Imperial Valley of California.

TIPAI
Tipai is a durum wheat. It was developed by the University of California, Davis and released in 2011. It was selected from the cross UC1113 *2/Kofa. Its experimental designation was UCD 06222/53. Tipai has very higher yield potential in the Imperial Valley (higher than Desert King) and excellent pasta quality. Tipai is susceptible to stripe rust so is not recommended for the Sacramento and San Joaquin valleys. It has medium late maturity and averages about 37 inches in plant height, with fair straw strength. At the time of release, it was resistant to leaf rust, powdery mildew, and Septoria tritici leaf blotch, moderately resistant to BYD, and susceptible to stripe rust. It was evaluated as Entry 1585 in the UC Regional Cereal Testing program from 2008-present for late fall planting in the Central Valley and the Imperial Valley of California.

TOPPER
Topper is a durum wheat. It was released by World Wide Wheat in 1999. It was selected from a male-sterile facilitated recurrent selection population (WWW MSFRS Durum Quality Population). Its experimental designation was WWW D1128. It is awned, has medium late maturity, averages about 39 inches in plant height, and has good straw strength. At the time of release it was resistant to Septoria tritici leaf blotch and leaf rust, moderately resistant to stripe rust, and moderately susceptible to BYD. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1211 in the UC Regional Cereal Testing program from 1999-2007 and 2010-present for late fall planting in the Central Valley and the Imperial Valley of California.

UTOPIA
Utopia is a durum wheat. It was released by World Wide Wheat in 1999. It was selected from a male-sterile facilitated recurrent selection population (WWW MSFRS Low Input Population). Its experimental designation was D0I933. It has black awns, is medium early maturing, averages about 37 inches in plant height, and has poor straw strength. At the time of release it was resistant to Septoria tritici leaf blotch, leaf rust, and stripe rust, and moderately susceptible to BYD. It was evaluated as Entry 1213 in the UC Regional Cereal Testing program in 1999 for late fall planting in the Central Valley and the Imperial Valley of California.

VOLANTE
Volante is a durum wheat. It was released by Resource Seeds, Inc in 2008. It was selected from the cross Aldura/881//CND. Its experimental designations were RSI 00WV50014 and RSI Exp 14. It is awned, has medium maturity, averages about 34 inches in plant height and has good straw strength. At the time of release it was resistant to

Septoria tritici leaf blotch, moderately resistant to stripe rust and BYD, and susceptible to powdery mildew. It was evaluated as Entry 1431 in the UC Regional Cereal Testing program from 2004-present for late fall planting in the Central Valley and the Imperial Valley of California.

WB-MEAD

WB-Mead is a durum wheat. It was released by Monsanto Technology LLC in 2011. It was selected from the cross TA/Kofa//Kofa/3/Orita/4/Duraking. Its experimental designation was YU 802-4. WB-Mead is a low cadmium uptake durum cultivar. It most resembles the cultivar Orita. It is medium-late in maturity, averages about 35 inches in plant height, and has good straw strength. It was evaluated as Entry 1607 in the UC Regional Cereal Testing program from 2008-2010 for late fall planting in the Imperial Valley of California. WB-Mead is adapted to the Desert Durum area of Arizona and Southern California.

WESTMORE

Westmore is a durum wheat. It was released by Arizona Plant Breeders in 2007. It is a back-cross selection from UCD High Protein x APB D95-257. Its experimental designation was APB D257-11. It contains the GPC gene for improved grain protein content and the Yr36 gene for stripe rust resistance. Westmore has medium maturity, averages about 38 inches in plant height, and has fair to poor straw strength. Westmore has long narrow kernels with shallow creases. Heads are more lax that other durum cultivars and are oblong, compared to the general tapered heads of most durum cultivars. At the time of release it was resistant to leaf rust and Septoria tritici leaf blotch, moderately resistant to stripe rust and BYD, and susceptible to powdery mildew. It was evaluated as Entry 1484 in the UC Regional Cereal Testing program from 2005-present for late fall planting in the San Joaquin Valley and the Imperial Valley of California.

CURRENT CULTIVARS
SOFT WHITE SPRING WHEAT

ALPOWA

Alpowa is a soft white spring wheat. It was developed by Washington State University in cooperation with Idaho and Oregon AESs and USDA-ARS and released jointly by the Washington, Idaho, and Oregon AESs and USDA-ARS in 1994. It was selected from the cross Fielder//Potam 70/3/Walladay*2/4/Walladay/Potam 70 (= K80184/K790769). Its experimental designation was WA7677. It was meant as a replacement for Penawawa, Edwall and other standard soft white spring wheat cultivars. It has medium late maturity (heading is equal to Penawawa and maturity is one day earlier), averages about 42 inches in plant height (similar to Fieldwin and Penawawa), and has fair straw strength. Spikes are oblong-parallel, lax, and erect at maturity. Awns are white, 1-8 cm long, with longer awns from glumes of spikelets in the central and upper area of the spike; awns are shorter on lower spikelets. Glumes are white, glabrous, long, mid-wide, with mid-wide square shoulders and acuminate, medium short beaks. The seed is white to cream in color, with mid-long, soft texture, and ovate shape with a midsize germ and a smooth, mid-wide, mid-deep crease, with rounded cheeks. Brush is midsize to large, without collar. At the time of its release it was the highest yielding soft white spring wheat selected in the history of the Washington State University spring wheat breeding program. It was susceptible to Hessian fly and to a new race of stripe rust, but resistant to local races of leaf rust and stem rust. It subsequently became susceptible to moderately susceptible to stripe rust, leaf rust, Septoria tritici leaf blotch, powdery mildew, and BYD. It was evaluated as Entry 1009 in the UC Regional Cereal Testing program from 1993-2006 and in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-present for spring planting in the intermountain region of northern California.

ALTURAS

Alturas is a soft white spring wheat. It was released by the Idaho AES in 2002. It was selected from the cross Whitebird/Centennial. Its experimental designation was IDO526. It is a semi-dwarf wheat with excellent yield and milling quality, adapted to rain-fed and irrigated production. Alturas is most similar in appearance to Centennial. Alturas has an unpigmented coleoptile and erect juvenile growth. It has a twisted flag leaf and an awned, erect, lax head, which is white-chaffed at maturity. Alturas has good straw strength and averages 85 cm tall, similar to Penawawa and Centennial, yet 3 cm shorter than Alpowa and Whitebird. It is medium maturing, similar in heading date to Jubilee, heading 1 day later than Centennial, 1 day earlier than Penawawa, Alpowa, and Whitebird, and 4 days earlier than

Treasure. Seed is soft, white, ovate, and plump, with a kernel type similar to Centennial, but approximately 1.8 mg per kernel larger. Alturas has the high-molecular weight glutenin profile of *Glu-A1a*, *Glu-B1f*, and *Glu-D1d*. Alturas has a high milling yield. Its soft wheat quality is unusual among soft white cultivars, due in part to the combination of low levels in the flour of damaged starch and pentosans, yet relatively strong gluten. It has an elevated flour hot-paste viscosity relative to wheat cultivars with functional alleles at all three loci of the Granule Bound Starch Synthase enzyme such as Whitebird, Treasure, and Jubilee. Alturas has peak Rapid Visco-Analyzer flour viscosity similar to partial waxy genotypes Centennial and Penawawa and likely carries the null mutation for *Wx-B1* derived from its parent Centennial. Alturas has excellent Asian noodle color. At the time of release Alturas had adult plant resistance to stripe rust similar to Centennial but susceptibility to the Hessian fly, similar to Whitebird and Centennial. It subsequently became moderately susceptible to stripe rust. It was evaluated as Entry 1228 in the UC Regional Cereal Testing program from 1999-2006 and in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-present for spring planting in the intermountain region of northern California. *Crop Science 44:1477-1478 (2004)*

BABE

Babe is a soft white spring wheat. It was developed by the Agricultural Research Center of Washington State University in cooperation with the USDA-ARS and released in 2009. It was selected from the cross Alpowa/3/Centennial/Wawawai//Alpowa. Its experimental designation was WA8039. It was intended as a high yielding replacement for Alpowa with improved emergence and higher levels of HTAP resistance to stripe rust. It has outstanding grain yield potential across a broad range of production conditions, high test weight, excellent end-use quality and high levels of HTAP resistance. It is a semidwarf with mid-late season maturity, common head type, white straw and white glumes. It is 1 to 6 inches shorter than Louise and similar in height to Alturas. Its average heading date is similar to those of Louise and Alpowa. At the time of release it was moderately susceptible to stripe rust (but with a high level of HTAP resistance) and moderately susceptible to Hessian fly. It was evaluated in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2010-present for spring planting in the intermountain region of northern California. *(Washington Crop Improvement Association website: http://washingtoncrop.com/seed/varieties.asp*)

DIVA

Diva is a soft white spring wheat. It was developed by the Agricultural Research Center of Washington State University in cooperation with the USDA-ARS and released in 2009. Its experimental designation was WA8090. It was derived from the cross Treasure/Wawawai/Louise. Diva has outstanding grain yield potential across a broad range of production environments, high test weight, outstanding end-use quality, high levels of resistance to the Hessian fly, and high levels of HTAP resistance to stripe rust from the same source as Louise. Diva provides an excellent soft white spring wheat option in the low rainfall zone where the low test weight of Louise can be a concern. Its broad adaptation overlaps with the target production areas of both Whit and Babe, which would expand cultivar options for producers in those areas. Diva is a semidwarf with mid-late season maturity, common head type, white straw and white glumes. It is 1 to 4 inches shorter than Louise and 1 to 3 inches taller than Alturas, Whit, Nick, and Alpowa. Its average heading date is similar to those of Louise, Alpowa and Babe, and 2 to 4 days later than those of Nick and Whit. At the time of release it had a high level of HTAP resistance to stripe rust and was moderately resistant to Hessian fly. It was evaluated in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2010-present for spring planting in the intermountain region of northern California. *(Washington Crop Improvement Association website: http://washingtoncrop.com/seed/varieties.asp*)

JD

JD is a soft white (club) spring wheat. It was developed by the Agricultural Research Center of Washington State University in cooperation with the USDA-ARS and released in 2009. It was derived from the cross Eden//Coda/PI 574357 (Wawawai sib). Its experimental designation was WA8047. It is stripe rust resistant and high yielding, with broad adaptation and excellent milling and baking quality. JD is a semidwarf with mid-late season maturity, club head type, white straw and white glumes. It is 1 to 5 and 2 to 7 inches taller than Eden and Calorwa, respectively, slightly taller than Alpowa and slightly shorter than Louise. Its heading date is 1 to 3 days later than Eden and similar to Louise and Alpowa. At the time of release it was resistant to stripe rust and susceptible to Hessian fly. It was evaluated in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2010-present for spring planting in the intermountain region of northern California. *(Washington Crop Improvement Association website: http://washingtoncrop.com/seed/varieties.asp*)

NEW DIRKWIN

New Dirkwin is a soft white spring wheat. It was developed by Baglietto Seed Company. Release is planned for the 2012/2013 season. It is derived from Dirkwin (selected from the cross Twin/Triple Dirk). Stripe rust resistance genes *Yr5* and *Yr15* and the *Aegilops ventricosa* 2NS translocation carrying resistance genes to stripe rust *Yr17*, leaf rust *Lr37*, and stem rust *Sr38*, were introduced by five backcross generations into Dirkwin and then combined using marker assisted selection at UC Davis (project supported by Baglietto Seeds Inc.). Breeder seed was provided to Baglietto Seed Company for increase. New Dirkwin is very similar to the original Dirkwin, with late season maturity, average plant height of about 42 inches, and fair to poor straw strength, but with resistance to prevalent races of the stripe rust pathogen present in California. At the time of release, it was resistant to stripe rust and leaf rust, moderately resistant to powdery mildew and BYD, and moderately susceptible to Septoria tritici leaf blotch. It was evaluated as Entry 1667 in the UC Regional Cereal Testing program from 2010-present for late fall planting in the Central Valley and southern desert areas of California where its intended use is as forage.

NICK

Nick is a soft white spring wheat. It was released by Westbred LLC in 2003. It was selected from the cross Sprite/Discovery//Wakanz/Vanna. Its experimental designation was WPB BZ 698-31. It is a semidwarf (averages about 40 inches in plant height) with fair straw strength and medium-early maturity. The head is strap shaped, mid-dense, awned and slightly inclined at maturity. The chaff color is white at maturity and the stem is hollow. The glume shoulders are square and acuminate. The seed is soft, white and ovate with rounded cheeks. The brush is large, medium in length and not collared. The crease is narrow and shallow. At the time of release it was resistant to leaf rust, moderately resistant to stripe rust and powdery mildew, and tolerant of the Hessian fly. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1384 in the UC Regional Cereal Testing program from 2002-2006 and in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-2010 for spring planting in the intermountain region of northern California. *(from Washington Crop Improvement Association website: http://washingtoncrop.com/seed/varieties.asp*)

TWIN

Twin is a soft white spring wheat. It was developed cooperatively by the Idaho AES and the USDA-ARS and released by the Idaho, Oregon, and Washington AESs and USDA-ARS in 1971. It was selected from the cross Lemhi 53 *3//Norin 10/Brevor/3/Lemhi 62/4/Chinese Spring/*Aegilops umbellulata*//7*Lee/3/5*Lemhi. Its experimental designation was IDO015. Twin is a sister selection of Springfield. It is a semi-dwarf with moderately stiff straw and medium maturity. Spikes are erect to inclined, awnless (rarely apically awnletted, awnlets 2-6 mm long), oblong to clavate, dense (lower 1⁄2 of head is mid-dense). Glumes are glabrous, white, long and wide; shoulders are mid-wide, oblique to rounded and beaks are mid-wide, obtuse and 0.5 mm long. Kernels are white, short, soft, oval to ovate with a mid-wide, deep crease. Cheeks are rounded and the brush is mid-sized and mid-long. Pastry quality is satisfactory and similar to that of Lemhi 66 and Springfield. At the time of release it was resistant to stripe rust and stem rust, moderately susceptible to BYD, and susceptible to leaf rust and powdery mildew. It subsequently became susceptible to stripe rust and Septoria tritici leaf blotch. It was evaluated as Entry 175 in the UC Regional Cereal Testing program from 1980-91 and from 1996-2004 for spring planting in the intermountain region of northern California. *Crop Science 12: 259 (1972)*

WHIT

Whit is a soft white spring wheat. It was developed by the Agricultural Research Center of Washington State University in cooperation with the Agricultural Experiment Stations of the University of Idaho and Oregon State University, and the USDA-ARS and released in 2008. It was derived from the cross Challis/5/EI Gaucho/Sonora 64//Spr Luke Mutant/3/Centennial/4/Alpowa. Its experimental designation was WA8008. Whit was released as a replacement for Alpowa and Nick in non-irrigated wheat production systems in the intermediate to high rainfall regions in Washington and Idaho based on its resistance to the Hessian fly, HTAP to stripe rust, short stature, medium early maturity, and high grain yield potential. It has excellent end-use quality. The heading date is one day earlier than Louise, three to four days earlier than Alpowa, and one day later than Nick. Whit is an intermediate height, semidwarf, similar in height to Nick and 3 to 13 cm shorter than both Louise and Alpowa. Whit has fair straw strength. It has lax, tapering, erect inflorescence with tan awns and tan glumes that are long in length, medium in width, with wide, square shoulders and medium acuminate beaks. Whit lacks anthocyanin pigmentation in the coleoptile, displays a semi-erect juvenile plant growth habit, and is green in color with recurved, twisted, waxy flag leaf at Feekes growth stage 10.0. The stem lacks anthocyanin pigmentation, a waxy bloom is absent, the last internode of the rachis is semi-solid. At the time of release it

had high levels of HTAP to stripe rust and resistance to Hessian fly. It is moderately resistant to powdery mildew. It subsequently became susceptible to stripe rust. It was evaluated in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-present for spring planting in the intermountain region of northern California. *(Washington Crop Improvement Association website: http://washingtoncrop.com/seed/varieties.asp*)

CURRENT CULTIVARS
SOFT WHITE WINTER WHEAT

AP BADGER

AP Badger is a soft white winter wheat developed by Syngenta Cereals and released in 2010. It is an F_3 derived, single plant selection from the cross Stephens3*/SF4//Stephens/3/ORATORIO. Its experimental designation was REM POP-80-03. It is a short semidwarf and has white chaff at maturity. It has medium maturity and good straw strength. AP Badger is similar to the cultivar Stephens in many respects but more often than not has a higher tiller number, shorter, more box-shaped heads than Stephens and is about 2 inches shorter than Stephens. AP Badger is best adapted to higher rainfall dryland production in eastern Washington, west-central Idaho and northeastern Oregon, Washington, and irrigated production in the southern Snake River region of Idaho, northern Oregon and the Basin of Washington. It is susceptible to stripe rust. It was evaluated in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2010-present for fall planting in the intermountain region of northern California. *(Washington Crop Improvement Association website: http://washingtoncrop.com/seed/varieties.asp*)

AP LEGACY

AP Legacy is a soft white winter wheat developed by Syngenta Cereals and released in 2009. It is an F_3 derived, single plant selection from the cross Stephens/Madsen//Rod. The final cross was made in 1998 by Dr. C. L. Peterson, Oregon State University who made the population available to AgriPro Wheat in 1999. Its experimental designation was ORF2BC9800267-03. AP Legacy is best adapted to higher rainfall dryland production in eastern Washington, west-central Idaho and northeastern Oregon and dryland production along the Highway 2 corridor of Washington. AP Legacy is a tall semidwarf and has white chaff at maturity. It has medium-early maturity and good straw strength. Juvenile growth habit is semi-erect. Plant color at boot stage is green. Anther color is yellow. Auricle anthocyanin and auricle hairs are present. Flag leaf at boot stage is recurved and twisted. Head shape is strap and spikes are awned. Glumes are midlong in length and wide in width. Glume shoulder shape is wanting with an acuminate beak. Seed shape is ovate. Brush hairs on the seed are long in length and occupy a medium area of the seed tip. Seed depth is middeep and width is midwide. Seed cheeks are angular. At the time of release it was resistant to prevalent races of stripe rust and moderately resistant to dryland footrot. It subsequently became susceptible to stripe rust. It was evaluated in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2010-present for fall planting in the intermountain region of northern California. *(Washington Crop Improvement Association website: http://washingtoncrop.com/seed/varieties.asp*)

BRUNDAGE 96

Brundage 96 is a soft white winter wheat. It was developed by the Idaho AES and released in 2001. It was selected from the cross Stephens/Geneva. Its experimental designation was ID-B-96. Brundage 96 was released as a replacement for Brundage in the rainfed areas of the Pacific Northwest on the basis of its high grain yield potential, end-use quality, and improved stripe rust resistance. Brundage 96 is similar to Brundage in appearance and is an awnletted, semi-dwarf (averages about 40 inches in plant height with good straw strength in the intermountain area of California) with a dark blue-green plant color and erect to semi-erect flag leaves. Glumes are white, with an oblique shoulder and obtuse peak. The kernel characteristics are similar to those of Brundage, being white, soft, ovate with a midsized germ and a mid-deep to deep crease. It has medium early maturity (the days to anthesis is the same as Stephens and later than Brundage). At the time of release it had adult plant resistance to stripe rust and was resistant to leaf rust, and susceptible to cephalosporium stripe, strawbreaker foot rot, Septoria tritici leaf blotch, common bunt, and dwarf bunt. It was evaluated as Entry 1389 in the UC Regional Cereal Testing program from 2003-2006 and in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-present for fall planting in the intermountain region of northern California. *Crop Science 43:1884 (2003)*

BRUNEAU
Bruneau is a soft white winter wheat. It was developed by the Idaho AES and released in 2009. It was selected from the cross 85-01008/85-02012. Its experimental designation was ID93-64901A. Bruneau combines high yield potential, adaptation to high rainfall-rainfed and irrigated growing conditions, and end-use quality that is similar to Brundage. Bruneau is 1 to 2 inches taller than Stephens. It has mid-late season maturity and fair straw strength. Unlike many soft white winter wheat cultivars, Bruneau maintains its yield advantage in late fall plantings as well as Stephens, WB 528, and Tubbs 06. It has excellent milling and baking quality. Test weight is similar to Stephens. At the time of release it was resistant to stripe rust. It subsequently became moderately resistant to stripe rust. It was evaluated in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2008-present for fall planting in the intermountain region of northern California.

CARA
Cara is a soft white winter club wheat. It was developed by the USDA-ARS with assistance from the Washington Agricultural Experiment Station and the Oregon Agricultural Experiment Station. It was released in 2007. It was selected from the cross WA7752/WA6581/WA7217. The pedigree of WA7752 (sister line to Coda or PI 594372) is Tres (Cltr 17917) /Madsen (PI511673)//Tres=Tres/WA7163 (PI511673)//Tres. The pedigree of WA6581 (PI486428) is Omar (CItr 13072)/1834. The pedigree o f WA7217 (PI 561035) is VPM/Moisson951//2*Barbee (Cltr 17417). Its experimental designations were ARS97135 and ARS97135-9 and it is derived from a population with the cross number 92X102. Cara has a combination of yield potential, and resistance to multiple diseases (including resistance to stripe rust, powdery mildew and strawbreaker foot rot) with the quality characteristics desired for the club wheat market class. Cara is later and shorter than Tubbs for heading date and height, respectively. Cara has a maturity equal to Chukar and Coda, slightly earlier than Eltan and Finch. Cara has a height equal to that of Stephens, and poor straw strength. Cara has winter hardiness equal to Chukar, Bruehl, and Coda, not as good as Edwin and Masami, but better than Stephens. Cara is an awnless, white chaffed, club wheat with white kernels. It was evaluated in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-present for fall planting in the intermountain region of northern California. *(Washington Crop Improvement Association website:http://washingtoncrop.com/seed/varieties.asp*)

GOETZE
Goetze is a soft white winter wheat. It was developed by Oregon State University in cooperation with USDA-ARS and released in 2007. It was derived from the cross OR8303765/E81FR which was made in 1995 by breeders of HybriTech Seed International, Inc., a division of the Monsanto Company. OR8303765 has the pedigree 6720-11//Ministerio de Agri 38/ WRM (Weique/Red Mace). Selection 6720-11 is a sister of CI17576 with the pedigree Cappelle Desprez/Pullman sel. 101//Druchamp. The origin and pedigree of E81FR are unknown. Goetze was among the HybriTech wheat germplasm donated by Monsanto to Oregon State University in 2000. Its experimental designation was ORH010920. Goetze was released for its superior yield potential, disease resistance, short stature, medium-early maturity, and adaptation to Oregon production conditions. It has good straw strength. Goetze is best adapted to the Willamette valley and areas of Oregon where the cultivar Gene is commonly grown. Crown freezing tests conducted by USDA-ARS suggest that Goetze has less cold tolerance than the leading cultivars Stephens or Tubbs, more similar to the cultivar Gene. Goetze is most similar to the cultivars Stephens, Westbred 528, and Foote. Stephens and Westbred 528 are of the same market class, winter type, semi-dwarf, awned, similar maturity, and adapted to a similar growing area as Goetze. Goetze differs from Stephens and Westbred 528 in that it is a facultative wheat, meaning it is grown from fall plantings, but does not require cold-temperature vernalization to flower. At the time of release, Goetze was resistant to prevalent races of stripe rust, moderately resistant to Septoria tritici leaf blotch, moderately resistant to prevalent races of leaf rust, intermediate in response to strawbreaker footrot, moderately susceptible to Cephalosporium stripe, and susceptible to dwarf bunt. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1515 in the UC Regional Wheat Testing program in 2006 and in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-present for fall planting in the intermountain region of northern California. *(Washington Crop Improvement Association website: http://washingtoncrop.com/seed/varieties.asp*)

LEGION
Legion is a soft white winter wheat developed by AgriPro Wheat and released in 2008. It is an F_3 derived, single plant selection from the cross 939515 (Tubbs Sib)/Stephens 3*/SF4. Its experimental designation was 99x1009-23. It is a tall semidwarf and has white chaff at maturity. It has medium maturity. It is best adapted to higher rainfall dryland production in eastern Washington, west-central Idaho and northeastern Oregon and dryland production along the Highway 2 corridor of Washington. Juvenile growth habit is semi-erect. It has fair to poor straw strength. Plant color at

boot stage is blue green. Anther color is yellow. Auricle anthocyanin and auricle hairs are present. Flag leaf at boot stage is erect and twisted. Head shape is strap and heads are awned. Glumes are long in length and wide in width. Glume shoulder shape is wanting with an acuminate beak. Seed shape is ovate. Brush hairs on the seed are long in length and occupy a large area of the seed tip. Seed depth is shallow and width is narrow. Seed cheeks are rounded. It is moderately susceptible to stripe rust and strawbreaker footrot, and susceptible to dwarf bunt. It was evaluated in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-present for fall planting in the intermountain region of northern California. *(Washington Crop Improvement Association website: http://washingtoncrop.com/seed/varieties.asp*)

MARY

Mary is a soft white winter wheat. It was developed by the Oregon AES as a replacement for Stephens for release in 2012. It was selected from the cross SPN/Madsen/3/WA7163 Sister/SA463-GBR//Stephens. Its experimental designation was OR2040726. Primary adaptation is the dryland and irrigated production areas of north-central and northeast Oregon, and southeast and south-central Washington where Stephens or Westbred 528 are commonly grown. It is a short stature, moderately early maturing cultivar with superior straw strength. Mary has intermediate winter hardiness (better than Stephens and Tubbs). It is recommended for late seedings and is ranked excellent for milling and baking quality. At the time of release it was moderately resistant to stripe rust, and susceptible to Septoria tritici leaf blotch, crown rot, Cephalosporium stripe, and foot rot. It was evaluated in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2008-present for fall planting in the intermountain region of northern California.

SKILES

Skiles is a soft white winter wheat. It was developed by Oregon State University in cooperation with the USDA Agricultural Research Service (USDA-ARS) and released in 2008. Skiles was derived from the cross Dusty/ZGP-4074//Unknown. Skiles was among the HybriTech germplasm donated by Monsanto to Oregon State University in 2000. Its experimental designation was ORH0100085. It is an awned, short-statured, semidwarf with high yield potential, high test weight, and excellent winter cold tolerance. It is best adapted to dryland wheat-growing regions in northeast Oregon and southeast Washington where Stephens, Tubbs 06, and Madsen are commonly grown. It is midseason-maturing, similar to Brundage 96, ORCF-101, ORCF-102, Salute, and Tubbs 06. Height is similar to that of Stephens. Straw strength of Skiles is good. At the time of release it was resistant to stripe rust and moderately resistant to Fusarium crown rot (dryland foot rot) and Cephalosporium stripe, and susceptible to strawbreaker footrot, powdery mildew and Septoria tritici leaf blotch. It was evaluated in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2009-present for fall planting in the intermountain region of northern California. *(Washington Crop Improvement Association website: http://washingtoncrop.com/seed/varieties.asp*)

STEPHENS

Stephens is a soft white winter wheat. It was developed by the Oregon AES in cooperation with USDA-SEA and released in 1977. It was selected from the cross Nord Desprez/Pullman Selection101. Its experimental designation was OR 65-116. It is a medium height semi-dwarf (averages about 41 inches in plant height, with fair straw strength), with early-mid maturity. It is high yielding and widely adapted, and has average winter hardiness. Spikes are awned, fusiform, mid-dense, and inclined with glabrous, white, mid-long glumes. The shoulders are narrow, oblique, with beaks narrow, acuminate, and 2-3 mm long. Kernels are relatively large, white, soft, and ovate with small to mid-size germ and mid-wide, mid-deep crease. It has acceptable overall soft white wheat quality characteristics. At the time of release it was resistant to stripe rust (adult plant resistance), and common bunt, moderately resistant to powdery mildew, moderately susceptible to leaf rust, and susceptible to dwarf bunt, Septoria tritici leaf blotch, and Cephalosporium stripe. It subsequently became moderately resistant to stripe rust and susceptible to common bunt. It was evaluated as Entry 397 in the UC Regional Cereal Testing program from 1982-2006 and in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-present for fall planting in the intermountain region of northern California. *Crop Science 18: 1097 (1978)*

SY OVATION

SY Ovation is a soft white winter wheat. It was developed by AgriPro (Syngenta Cereals) for release in 2012. It was selected from the cross ORH010837(OR 0845/E81FR)/OR2001611. Its experimental designation was 03PN-108#21. It was selected on the basis of the absence of stripe rust, short plant height, and medium maturity. It has shown good adaptation in the high to moderate rainfall regions of western Idaho, eastern Washington, north-central and northeastern Oregon and irrigated production in the southern Snake River region of Idaho and the irrigated production areas of

Washington. Juvenile growth habit is semi-erect. The flag leaf is waxy, recurved and twisted. Plant height averages 98 cm. Spike shape is strap, oblong and spikes are middense. Awns are white and glumes are white and long. The shoulder is oblique and midwide. The beak is acuminate and long. There is no glume pubescence. Seed shape is elliptical and cheeks are rounded. At the time of release, it was resistant to prevalent races of stripe rust. It subsequently became moderately resistant to stripe rust. It was evaluated in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2011-present for fall planting in the intermountain region of northern California.

TUBBS

Tubbs is a soft white winter wheat. It was released by the Oregon AES in 2002. It was selected from the cross Madsen/Malcolm. Its experimental designation was OR939526. It has medium maturity; heading averages 2 days later than Stephens and 2 days earlier than Weatherford. Plant height averages about 42 inches, 2 inches taller than Stephens and 1.3 inches taller than Madsen. It has good straw strength. Cold tolerance and winter hardiness are similar to Stephens, Madsen, and Weatherford. Tubbs has overall quality attributes similar to Stephens, Weatherford, and Madsen and is considered acceptable for soft wheat applications. At the time of release it was resistant to strawbreaker footrot, leaf rust, and common bunt, moderately resistant to crown rot, moderately susceptible to Septoria tritici leaf blotch, and susceptible to stripe rust (but has adequate adult plant resistance), Cephalosporium stripe, and dwarf bunt. It subsequently became susceptible to leaf rust. It was evaluated as Entry 1455 in the UC Regional Cereal Testing program from 2005-06 and in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-2009 for fall planting in the intermountain region of northern California.

WB-JUNCTION

WB-Junction is a soft white winter wheat. It was developed by Westbred LLC for release in 2012. Its experimental designation was BZ6W02-616. It is early maturing with average plant height, good straw strength, excellent test weight, good protein content and milling and baking quality, and excellent yield potential. At the time of release it was resistant to stripe rust and leaf rust, moderately resistant to strawbreaker footrot, and susceptible to Cephalosporium stripe. It subsequently became moderately resistant to stripe rust. It was evaluated in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2010-present for fall planting in the intermountain region of northern California.

WB-528

WB-528 is a soft white winter wheat. It was released by Westbred LLC in 2004. It was selected from the cross Westbred 470/Madsen. It was developed to replace Westbred 470. It has medium maturity and plant height that averages about 40 inches, with good straw strength. It is high yielding with high test weight and good quality characteristics. The juvenile plant growth is semi-erect and the plant color at boot stage is blue-green. The leaves at boot stage are recurved and twisted. The stem is hollow with a waxy bloom and stem anthocyanin is absent. The head is awned, mid-dense, strap shaped and inclined at maturity. The glumes are white, acuminate and have an oblique shoulder. The seed is elliptical shaped with rounded cheeks. The brush is large with medium length hairs and is not collared. The germ is mid-sized, the crease is mid-wide and mid-deep. At the time of release it was resistant to stripe rust and leaf rust and moderately susceptible to powdery mildew. It subsequently became moderately susceptible to stripe rust. It was evaluated in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-present for fall planting in the intermountain region of northern California.

XERPHA

Xerpha is a soft white winter wheat. It was developed by the Agricultural Research Center of Washington State University and released in 2008. It was selected from the cross Eltan/Estica. Its experimental designation was WA007973. It is similar in plant height to Madsen, Eltan and Tubbs. Xerpha is slightly more cold tolerant than Tubbs and Madsen, and similar to Eltan. It has midseason maturity, about 2 days earlier than Eltan, similar to Madsen, and 2 days later than Tubbs. It has fair to poor straw strength, and resists lodging slightly better than Eltan and slightly less than Tubbs. It has durable high-temperature, adult-plant resistance to stripe rust, tolerance to Cephalosporium stripe, is moderately resistant to snow mold, and susceptible to strawbreaker footrot. It was evaluated in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-present for fall planting in the intermountain region of northern California. *(Washington Crop Improvement Association website: http://washingtoncrop.com/seed/varieties.asp*)

YAMHILL
Yamhill is a soft white winter wheat. It was released by the Oregon AES in 1969. It was selected from the cross Heines VII/Alba. Its experimental designations were Cor. 61-1227-66-7 and C801060. It is mid-tall with white stiff straw. The spike is awnletted, dense, inclined, and fusiform to oblong in shape. Glumes are glabrous, white, and wide with narrow to mid-wide shoulders. Beaks are obtuse to acute and 1-2 mm long. Kernels are white, mid-long, soft, ovate to oval and have a small germ. The crease is narrow to mid-wide with deep rounded cheeks. A midsize to mid-long brush is present. At the time of release it was resistant to stripe rust, moderately resistant to leaf rust and leaf blotch, and susceptible to common and dwarf smut. It subsequently became susceptible to stripe rust and moderately susceptible to leaf rust. It was evaluated as Entry 136 in the UC Regional Cereal Testing program in 1982, from 1986-87, in 1994, and from 2000-03 for fall planting in the intermountain region of northern California for grain and forage production. *Crop Science 12: 397-398 (1972)*

CURRENT CULTIVARS
HARD RED WINTER WHEAT

(No hard red winter wheat cultivars are currently grown in California; see Cultivar Archives for previously evaluated cultivars)

CULTIVARS/LANDRACES USED BY ORGANIC AND ARTISAN GROWERS (For Whole Wheat Stone Milling)

In general, plants of the cultivars in this section are significantly taller than modern conventional cultivars. The cultivars described below should be grown in suitable climatic regions without irrigation, or planted later in the fall (or early winter) in order to minimize lodging. (Much of the information in this section is from http://sustainablegrains.org/)

COMMON WHEAT (hexaploid, free threshing), *Triticum aestivum* ssp *aestivum*

SONORA
Sonora (CItr 3036) is a common wheat (*Triticum aestivum* ssp *aestivum*). It was selected from a landrace in Durango, Mexico. Sonora wheat might be the very first wheat successfully introduced onto the American continent soon after Columbus's journey in 1492. The agricultural Native Americans in Mexico used it to make whole wheat tortillas, and apparently liked the way it could be ground to a whole wheat flour on their metate. Sonora was grown in the Southwest continuously until about 1960, and was revived again from USDA seed stock beginning in the 1990s. It is an awnless spring wheat and has pale yellow (white) seed color. The bronze colored glumes are covered with fine hairs, giving them a velvety appearance. The grains are graded as "soft white wheat", but the hardness is almost enough to grade as "hard white wheat" (although the gluten is "soft"). The quality of starch, together with a very low tendency for the dough to darken on standing, contribute to its specific usefulness in Asian-style noodles and pasta, short pastry and flour tortillas. It produces a very light colored whole wheat flour with mild flavor that makes it ideal for many kinds of baked goods: pizza and pocket bread, cookies, cakes and pies, as well as breakfast cereals. The Sonora wheat dough, and final bread texture, is refreshingly different from that of hard red wheat cultivars. A pleasing open bread cell structure is achievable, especially when the grain protein is close to 15%, but with a shortness of crust that is welcomed for Scandinavian-style open sandwiches. Asian-style noodles and Italian-style pasta, as well as Mexican flour tortillas and Indian rotis, are successful products that are made from whole wheat flour from Sonora. Sonora has been tested in California over the past 6-8 years in fields of 5-10 acres. In those tests, yields varied from 20 to 40 bushels per acre, according to soil fertility and drainage, extent of fertilization, and winter rainfall. It has good drought tolerance. At the time of evaluation by the UC Regional Testing program, it was later heading than conventional cultivars (about two weeks later than Patwin), and averaged about 50 inches in plant height (due to its plant height, it was more susceptible to lodging than most conventional cultivars). It was resistant to powdery mildew, moderately resistant to stripe rust, moderately susceptible to Septoria tritici leaf blotch, and susceptible to leaf rust. It was evaluated as Entry 1619 in the UC Regional

Common Wheat Testing program in 2009 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

WIT WOLKORING

Wit Wolkoring (PI 479660) is a common wheat (*Triticum aestivum* ssp *aestivum*). It is from South Africa and was selected from a landrace. It is an awnless spring wheat and has pale yellow (white) seed color. The pale yellow glumes are covered with fine hairs in a manner similar to Sonora. The main visible difference between Wit Wolkoring and Sonora is the glume color. The grains are soft enough to be graded as "soft white wheat" and the quality of the gluten is "soft". It produces a whole wheat flour with light bran coloration that does not easily darken further in dough and can be used for making a wide range of whole wheat foods, similar to Sonora: single rise breads, cookies, cakes and pastries, noodles, pasta, as well as breakfast cereals. Wit Wolkoring (also called white woolly wheat because of the velvety appearance of the head) was selected by Whole Grain Connection as an alternative "white wheat" to Sonora. Wit Wolkoring has good drought tolerance. At the time of evaluation by the UC Regional Testing program, it was later heading than conventional cultivars (about 10 days later than Patwin), averaged about 50 inches in plant height (and was more susceptible to lodging than most conventional cultivars because of its plant height), and was resistant to powdery mildew, moderately resistant to stripe rust, and susceptible to Septoria tritici leaf blotch and leaf rust. It was evaluated as Entry 1620 in the UC Regional Common Wheat Testing program in 2009 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

CHIDDAM BLANC DE MARS

Chiddam Blanc de Mars (CItr 7327; PI 58556) is a common wheat (*Triticum aestivum* ssp *aestivum*). It is a cultivar from Ville de Paris, France, and was selected from an English landrace. It was originally chosen for production in California because the French have such a wonderful reputation for good bread - thinking of Poilane's whole wheat country loaf. Chiddam Blanc de Mars is an awned spring wheat and has pale yellow (white) seed color. The grains are very soft and grade as "soft white wheat". The gluten also is "soft". It produces a whole wheat flour with light colored bran that can be used for making a wide range of wheat foods: soft wheat breads, cookies, cakes and pastries, as well as breakfast cereals. The dough has a strong tendency to darken on standing due to high polyphenol oxidase activity. It is often more prolific than Sonora. It is relatively short in stature (it usually is at least 2-3 feet tall), and is somewhat less likely to lodge than Sonora. It may yield better than Sonora in higher rainfall areas in northern California or on soils with good water retention. At the time of evaluation by the UC Regional Testing program it averaged about 42 inches in plant height with good resistance to lodging, and was susceptible to stripe rust. It was evaluated as Entry 1668 in the UC Regional Common Wheat Testing program in 2010 for late fall planting at rainfed sites in the Central Valley and surrounding areas.

INDIA-JAMMU

India-Jammu (CItr 7289; PI 57906) is a common wheat (*Triticum aestivum* ssp *aestivum*). It is a landrace from Jammu and Kashmir, India. It is an awnless spring wheat and has pale golden (white) seed color. The grains are hard enough to be graded as "hard white wheat". The gluten is strong and typical of good breadmaking hard red wheat cultivars. It produces a whole wheat flour with unobtrusive bran coloration and the dough does not darken on standing. It can be used for making whole wheat foods: bread, cookies, cakes and pastries, as well as breakfast cereals. India-Jammu was intended to be an alternative to Sonora, both from the agricultural and end use viewpoints. Subsequent testing has shown that India-Jammu has desirable whole wheat artisan breadmaking properties. At the time of evaluation by the UC Regional Testing program, it averaged about 51 inches in plant height with fair resistance to lodging, and was moderately resistant to stripe rust. It was evaluated as Entry 1669 in the UC Regional Common Wheat Testing program in 2010 for late fall planting at rainfed sites in the Central Valley and surrounding areas.

FOISY

Foisy (CItr 5246) is a common wheat (*Triticum aestivum* ssp *aestivum*). It is a historical West Coast wheat cultivar that was selected originally by Mr. Foisy in Oregon in 1865. It is an awnless, late maturing spring wheat and has pale yellow (white) seed color. The grains are quite soft; Foisy grades as "soft white wheat". It produces a whole wheat flour with unobtrusive bran coloration, and the dough does not darken on standing so it can be used for making a wide range of whole wheat foods: bread, cookies, cakes and pastries, as well as breakfast cereals. It is relatively higher yielding than Sonora, Wit Wolkoring, Chiddam Blanc de Mars, and India-Jammu under the same production system. Foisy is recommended for planting in slower draining soil and in the wetter regions of California. At the time of evaluation by the UC Regional Testing program it averaged about 59 inches in plant height with fair to good resistance to lodging, and was

moderately resistant to stripe rust. It was evaluated as Entry 1670 in the UC Regional Common Wheat Testing program in 2010 for late fall planting at rainfed sites in the Central Valley and surrounding areas.

SPELT WHEAT (hexaploid, not free threshing), *Triticum aestivum* ssp *spelta*

SPANISH SPELT

Spanish Spelt (PI 348428) is a spelt wheat (*Triticum aestivum* ssp *spelta*). It is a landrace from Oviedo, Spain. It is an awned winter type and has a Russet red seed color. Spelt found great favor in Hungary, much of Eastern Europe and Germany, and in the agricultural Alpine regions for many centuries, but was supplanted by hard red winter wheat when roller milling for refined flour became widespread after 1880. The advantageous characteristics of spelt include winter hardiness, disease resistance, and toughness of chaff that discourages attack by birds and insects. Spelt also is unlikely to sprout during a rainy summer when it nears maturity. In California, Spanish Spelt is best adapted to the wetter regions near the coast and at higher elevations where snowfall occurs. Spelt requires a long growing season so should be planted during October through early November, or before the first major rain of the season. The grain has thin red bran and a distinctly soft grain that gives interesting and characteristic whole grain flour. The gluten also is "soft". In order to fully process spelt for the whole grain miller, de-hulling is required following combine harvesting.

SWISS SPELT

Swiss Spelt (PI 347864) is a spelt wheat (*Triticum aestivum* ssp *spelta*). It is a landrace from Bern, Switzerland. It is an awnless winter type with light yellow colored glumes and a Russet red seed color. Spelt found great favor in Hungary, much of Eastern Europe and Germany, and in the agricultural Alpine regions for many centuries, but was supplanted by hard red winter wheat when roller milling for refined flour became widespread after 1880. The advantageous characteristics of spelt include winter hardiness, disease resistance, and toughness of chaff that discourages attack by birds and insects. Spelt also is unlikely to sprout during a rainy summer when it nears maturity. In California, Swiss Spelt is best adapted to the higher elevations where snowfall occurs so that plant growth is reduced to zero during the winter period. Swiss Spelt requires a long growing season so should be planted during October through early November, or just before the first major rain of the season. The grain has thin red bran and a very soft grain that gives interesting and characteristic whole grain flour. The gluten is "hard" which suggests that Swiss Spelt could be used for making whole wheat bread. In order to fully process spelt for the whole grain miller, de-hulling is required following combine harvesting.

EMMER WHEAT (tetraploid), *Triticum turgidum* ssp. *dicoccum*

ETHIOPIAN BLUE TINGE

Ethiopian Blue Tinge is an Abyssinian emmer wheat (*Triticum turgidum* ssp. *dicoccum*). It is a cultivar from Ethiopia selected by Dan Jason (Salt Spring Seeds, BC, Canada). It threshes easily when combine harvested (most emmer wheats do not thresh out of their husks during combine harvesting). It is a very long awned spring type and has an intriguing dark purple brown seed color. It has a tea like aroma and is fairly prolific. The bran color and flavor are due to the antioxidant polyphenolic compounds in the bran. In the whole wheat form, it probably ranks among the highest in healthful antioxidant capacity. Dough from the whole wheat flour darkens to the color of chocolate and correspondingly flavors the baked goods made from it. Ethiopian Blue Tinge is particularly successful as a dinner grain, single rise bread and as whole wheat pasta. The grain is distinctly hard, like the related durum wheat types; the protein level generally is higher than for common hexaploid wheat grown under similar circumstances. It is somewhat short in stature (usually is at least 2-3 feet tall). Its short stature may make it vulnerable to drought, so Ethiopian Blue Tinge is recommended for slower draining soils or wetter regions in California, and for supplying those who enjoy dark richly flavored whole wheat breads. At the time of evaluation by the UC Regional Testing program, it averaged about 40 inches in plant height with greater susceptibility to lodging than most conventional cultivars, and was moderately susceptible to stripe rust. It was evaluated as Entry 1671 in the UC Regional Common Wheat Testing program in 2010 for late fall planting at rainfed sites in the Central Valley and surrounding areas.

PASTA WHEAT (tetraploid, free threshing), *Triticum turgidum* ssp *durum*

BLUE BEARD

Blue Beard is a durum wheat. It was selected for its attractive appearance by Jim George from a group of landraces from Iran that were evaluated at UC Davis. It is a spring type and has awns and pale yellow seed color. Blue Beard has a spectacular dark blue head, and always attracts attention in the field. It grows well in the Sacramento Valley and offers the possibility of a supply for whole wheat pasta makers as well as bakers who know how to make pleasing whole durum wheat breads. The whole wheat dough does not darken on standing and the starch quality is similar to that of Kronos, a standard for pasta wheat quality. It is appealing to wheat weavers and straw artists, as well as florists, due to the interesting heads and long stem. It has good drought tolerance and tall plant height (can grow up to 5 feet in height). At the time of evaluation by the UC Regional Testing program it was later heading than conventional cultivars (about two weeks later than Desert King), averaged about 53 inches in plant height (and was more susceptible to lodging than most conventional cultivars), and was resistant to powdery mildew and Septoria tritici leaf blotch, and moderately resistant to stripe rust. It was evaluated as Entry 1630 in the UC Regional Durum Wheat Testing program in 2009 for late fall planting in the Central Valley and southern desert areas of California.

DURUM-IRAQ
Durum-Iraq (PI 481581) is a durum wheat. It is a landrace from Iraq. It is a spring type and has long black awns and pale yellow seed color. It grows well in the Sacramento Valley and offers the possibility of a supply for whole wheat pasta makers as well as bakers who know how to make pleasing whole durum wheat breads. The whole wheat dough does not darken on standing and the starch quality is similar to that of Kronos, a standard for pasta wheat quality. It is appealing to wheat weavers and straw artists, as well as florists, due to the attractiveness of the heads and long stem. It has good drought tolerance and tall plant height (can grow up to 5 feet in height). At the time of evaluation by the UC Regional Testing program it was later heading than conventional cultivars (about two weeks later than Desert King), averaged about 54 inches in plant height (and was more susceptible to lodging than most conventional cultivars), and was resistant to stripe rust, powdery mildew, and Septoria tritici leaf blotch. It was evaluated as Entry 1631 in the UC Regional Durum Wheat Testing program in 2009 for late fall planting in the Central Valley and southern desert areas of California.

TURGIDUM WHEAT (tetraploid, free threshing), *Triticum turgidum* ssp *turgidum*

AKMOLINKA
Akmolinka (PI 438971) is a cone wheat (*Triticum turgidum* ssp *turgidum*). It is a landrace from North Kazakhstan. The heads have a tendency to be branched at the base, giving the appearance of a cone-shaped head. Cone wheat is closely related to durum wheat, and the grain is very hard, much like durum wheat. Starch quality is similar to that of Kronos, the standard for durum pasta, and the dough does not darken on standing, so Akmolinka may be useful for whole wheat pasta. Cone wheat is very prolific, and produces long strong straw. Akmolinka is an awned spring type and has pale yellow seed color. It has tall plant height (can grow up to 5 feet in height). It has been grown successfully in the Sacramento Valley when planted in late November through early December. It has been most successful in wetter years.

MAPARCHA
Maparcha (PI 125343) is a poulard wheat (*Triticum turgidum* ssp *turgidum*). It is a landrace from Laghman, Afghanistan. Poulard wheat is closely related to durum wheat, the main distinction being that the grain of poulard wheat is much softer in texture. Poulard wheat is very prolific, and produces long strong straw. The starch quality of Maparcha is very unusual in that it appears to be very high in amylopectin, which should give it culinary properties similar to sticky rice and waxy corn. The dough does not darken on standing. Protein content is usually much lower than for any other wheat grown under similar conditions. Maparcha is an awned spring type and has pale yellow seed color. It has tall plant height (can grow up to 5 feet in height). It has been grown successfully in the Sacramento Valley when planted in late November through early December. It has been most successful in wetter years.

CULTIVAR ARCHIVES (Cultivars previously evaluated by UC Small Grains Program)

HARD RED SPRING WHEAT

ACCORD
Accord is a hard red spring wheat. It was developed by Western Plant Breeders. It was selected from a male-sterile facilitated recurrent selection population SHRSP-82. Its experimental designation was PH 984-75. It is medium early

maturing with good straw strength. It was evaluated as Entry 865 in the UC Regional Cereal Testing program from 1990-91 for late fall planting in the Central Valley and surrounding areas, the south-central coast, and the southern desert regions of California.

AIM

Aim is a hard red spring wheat. It was developed by Western Plant Breeders and released in 1978. It was selected from a male-sterile facilitated recurrent selection population MSFRS Pop. It is medium maturing with short, strong, yellow colored straw and reddish colored heads at maturity. Awns are rough, 5-12 cm long and reddish at maturity. Glumes are long and wide with rounded shoulders and acute beaks. Kernels are hard and red in color. At the time of release it was resistant to leaf rust and moderately resistant to BYD. It was evaluated as Entry 434 in the UC Regional Cereal Testing program in 1982 for late fall planting in the Central Valley and surrounding areas, the south-central coast, and the southern desert regions of California.

ANZA

Anza is a hard red spring wheat. It was released by the California AES in 1971. It was selected from the cross (Lerma Rojo*Norin 10-Brevor)*((Yaktana 54*Norin 10-Brevor)*Andes3) made in Mexico by N.E. Borlaug and associates in the Mexico-Rockefeller Foundation prior to the formation of the International Maize and Wheat Improvement Center (CIMMYT), and sent to California first in 1964. Its experimental designations were II 8739-4R-1M-1R, and D 6923.Very similar or identical cultivars were released in New Zealand (Karamu), Sudan (Mexicani), South Africa (Turpin 4), Chile (SNA-1), and Iran (Moghan-1). Anza is very similar to the Australian breeding line WW15. Anza has a spring growth habit and is short-statured with good lodging resistance and medium late-maturity. Spikes are fully awned, mid-dense, and erect with a tendency to nod at maturity. The peduncle is slightly S-shaped. Glumes are long and wide, short-awned, and cream to white in color. Shoulders are square and the beak is acuminate. Awns are white and 8-10 cm long. Kernels are red, hard, mid-long, and ovate. The crease is shallow and narrow. Cheeks are rounded. The brush is long. Collars are lacking. Grain typically is low in protein concentration, but milling performance is excellent. Flour is best suited for general purpose uses rather than bread-making. At the time of release it was resistant to moderately resistant to powdery mildew, BYD, and stripe rust, and susceptible to moderately susceptible to Septoria tritici leaf blotch and leaf rust. It subsequently became susceptible to stripe rust. It was evaluated as Entry 20 in the UC Regional Cereal Testing program from 1980-2011 for late fall planting in the Central Valley and surrounding areas, the south-central coast, and the southern desert regions of California. *Crop Science 24:827 (1984)*

BAKER

Baker is a hard red spring wheat. It was released by Western Plant Breeders. It was selected from a male-sterile facilitated recurrent selection population Early HRS Pop80. Its experimental designation was PH983-69. It has early maturity and good straw strength. At the time of evaluation it was moderately susceptible to BYD and leaf rust. It was evaluated as Entry 716 in the UC Regional Cereal Testing program from 1986-1992 for late fall planting in the Central Valley and surrounding areas, the south-central coast, and the southern desert regions of California.

BETH HASHITA

Beth Hashita is a hard red spring wheat. It was released by Hazara Seed in 2003. It was selected from the cross Barkia/B.Lehem//B.Lehem/3/Hazk. It is very early maturing, with fairly lax spikes and good straw strength. It has two levels of plant height. It is similar to Yecora Rojo in bread-making quality. At the time of release it was moderately resistant to stripe rust and moderately susceptible to Septoria tritici leaf blotch. It was evaluated as Entry 1258 in the UC Regional Cereal Testing program from 2000-2005 for late fall planting in the Central Valley and surrounding areas, the south-central coast, and the southern desert regions of California.

BONUS

Bonus is a hard red spring wheat. It was released by Resource Seeds, Inc. in 1998. It was selected from the cross Cleo/2Inia//PB775/Klasic. Its experimental designation was RSI 31206. It has medium early maturity and good straw strength. It was moderately resistant to powdery mildew, moderately susceptible to Septoria tritici leaf blotch and BYD, and susceptible to stripe rust and leaf rust. It was evaluated as Entry 1020 in the UC Regional Cereal Testing program from 1994-2003 for late fall planting in the Central Valley and surrounding areas, the south-central coast, and the southern desert regions of California.

BORAH
Borah a hard red spring wheat. It was released jointly by the USDA-ARS and the Idaho and Oregon AESs in 1974. It was selected from the cross Thatcher//Thatcher/Kenya Farmer/3/III-58-1//Frontana/3*Thatcher. Its experimental designation was IDO0043. It is a semi-dwarf with moderately stiff straw. It is intermediate in maturing and has awned spikes and white glumes. It has satisfactory milling and baking quality. At the time of release it was resistant to leaf rust, stripe rust, and stem rust. It was evaluated as Entry 471 in the UC Regional Cereal Testing program from 1982-1984 for spring planting in the intermountain region of northern California. *Crop Science 15:104 (1975)*

BRIM
Brim is a hard red spring wheat. It was released by Resource Seeds, Inc. in 2001. It was selected from the cross Tadorna/PB775//Express. Its experimental designation was RSI 96W51402. It has medium maturity and good straw strength. At the time of release it was resistant to leaf rust, moderately resistant to Septoria tritici leaf blotch and BYD, and susceptible to stripe rust. It was evaluated as Entry 1202 in the UC Regional Cereal Testing program from 1999-2001 for late fall planting in the Central Valley, surrounding areas, and the south-central coast region of California.

BROOKS
Brooks is a hard red spring wheat. It was released by Western Plant Breeders in 1994. It was selected from the cross 983-29/YRR-86. Its experimental designation was PH 988-131. It has medium early maturity and fair straw strength. It was moderately resistant to powdery mildew, moderately susceptible to BYD, and susceptible to Septoria tritici leaf blotch, stripe rust and leaf rust. It was evaluated as Entry 901 in the UC Regional Cereal Testing program from 1991-2003 for late fall planting in the Central Valley and surrounding areas, the south-central coast, and the southern desert regions of California.

BUCK PRONTO
Buck Pronto is a hard red spring wheat. It was developed by the breeding program of Buck Semillas S.A. in Argentina. USDA issued a PVP Certificate in 2001. It is an early maturing, awned, semidwarf with good straw strength, white glumes, a lax spike and hollow stem. It has high grain protein content and excellent milling and baking qualities. It produces strong gluten flour, so is a good candidate for strengthening weak flours. It heading date is similar to or slightly earlier than Tara 2002, but about 2-3 days earlier than Hank. The seed is large and elliptical in shape. At the time of evaluation it was resistant to stripe rust and stem rust, resistant to moderately resistant to leaf rust, and susceptible to loose smut. It subsequently became moderately susceptible to stripe rust. It was evaluated as Entry 1487 in the UC Regional Cereal Testing program from 2005-2006 and in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program in 2011 (when Buck Pronto became the property of Limagrain) for spring planting in the intermountain region of northern California. *(from Washington Crop Improvement Association website: http://washingtoncrop.com/seed/varieties.asp*)

BUTTE 86
Butte 86 is a hard red spring wheat. It was released by North Dakota Agricultural Experiment Station in 1986. It was derived from the cross Butte*2*/11/*(Waldron /8/(N0269, Conley/7/(ND122, Maria Escobar/Newthatch/6/Kenya 338AA/5/Lee/4/(N1831, Mida /3/(N1530, (H-44/Ceres, N1349-15)/2/Thatcher))))/9/(Justin/2/Dakuru/3*Conley, ND457)/3/Agent/*T. Timopheevi*, ND551) /10/Butte*2/6/(ND507, Waldron/5/(RL4205, Pembina*6/2/Thatcher*3/Transfer/4/Pembina*6/3/Thatcher*2/2/Marquis*6/Red Egyptian)). Its experimental designation was ND 597. It is awned, early maturing, with medium height. It is moderately susceptible to lodging, foliar disease, and black chaff. It has medium grain protein content. At the time of release it was resistant to stem rust and moderately resistant to leaf rust. It was evaluated as Entry 861 in the UC Regional Cereal Testing program from 1988-1989 for spring planting in the intermountain region of northern California.

CAVALIER
Cavalier is a hard red spring wheat. It was received for testing from Pillsbury and Continental Grain, and managed by World Wide Wheat. It was released in 1994. It was selected from a male sterile facilitated recurrent selection population (HRS MSFRS Quality Pop). Its experimental designations were PB BR5702 and CONT BR 5702. It is medium-early maturing and has fair straw strength. It is resistant to powdery mildew, moderately susceptible to BYD, and susceptible to stripe rust, leaf rust, and Septoria tritici leaf blotch. It was evaluated as Entry 827 in the UC Regional Cereal Testing program from 1989-2004 for late fall planting in the Central Valley and

surrounding areas, the south-central coast, and the southern desert regions of California.

CHALLENGER
Challenger is a hard red spring wheat. It was developed by Western Plant Breeders. It was selected from a male sterile facilitated recurrent selection population (MSFRS Pop Sel). It is medium maturing with good straw strength. It was evaluated as Entry 655 in the UC Regional Cereal Testing program in 1984 for spring planting in the intermountain region of northern California.

CHIEF
Chief is a hard red spring wheat. It was developed by World Wide Wheat and released in 1999. It was selected from a male sterile facilitated recurrent selection population (MSFRS DR Quality - HFR Selection). Its experimental designation was BR 2306. It is medium maturing with fair to poor straw strength. At the time of release it was resistant to stripe rust, moderately resistant to Septoria tritici leaf blotch, and moderately susceptible to leaf rust and BYD. It was evaluated as Entry 1203 in the UC Regional Cereal Testing program in 1999 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

CIANO T79
Ciano T79 a hard red spring wheat. It was developed by the International Maize and Wheat Improvement Center (CIMMYT) in cooperation with the Mexican Ministry of Agriculture (INIA) and released in 1979. It was selected from the cross Buckbuck 'S'. Its experimental designation was D8052. It is medium late maturing with fair to good straw strength. At the time of release it was resistant to stripe rust and moderately susceptible to Septoria tritici leaf blotch and BYD. It was evaluated as Entry 494 in the UC Regional Cereal Testing program from 1981-1982 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

COLUSA
Colusa is a hard red spring wheat. It was released by Western Plant Breeders in 1996. It was selected from the cross Baker/Yecora Rojo//8630039-87. Its experimental designation was PH 989-188. It is medium maturing with fair to poor straw strength. At the time of release it was resistant to leaf rust, moderately susceptible to Septoria tritici leaf blotch and BYD, and susceptible to stripe rust. It was evaluated as Entry 933 in the UC Regional Cereal Testing program from 1992-1993 and from 1995-1997 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

COMPANION
Companion is a hard red spring wheat. It was released by Resource Seeds Inc. in 1997. It was selected from the cross Cleo/2Inia//Klasic/3/Glennson. Its experimental designation was RSI 30915. It is medium maturing with good straw strength. At the time of release it was resistant to Septoria tritici leaf blotch, moderately resistant to stripe rust, and moderately susceptible to leaf rust and BYD. It was evaluated as Entry 1018 in the UC Regional Cereal Testing program from 1994-1997 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

COPPER
Copper is a hard red spring wheat. It was developed cooperatively by the USDA-ARS and the Idaho AES and released in 1986. It was selected from the cross Borah/3/Moran//Penjamo ‘S’/Gabo 55. Its experimental designation was IDO238. Copper has a spring growth habit and is short-statured with relatively weak straw (susceptible to lodging) and medium maturity. Spikes are awned, erect to inclined, with brown glumes. Milling and baking quality is very satisfactory. At the time of release it was resistant to stripe rust, and moderately resistant to leaf rust, powdery mildew, black chaff and black point. It was evaluated as Entry 651 in the UC Regional Cereal Testing program in 1984, from 1986-1989, and in 1993 for spring planting in the intermountain area of northern California. *Crop Science 28:577 (1988)*

CUYAMA
Cuyama is a hard red spring wheat. It was released by Western Plant Breeders in 1995. It was selected from a male sterile facilitated recurrent selection population (SEPHRSP-88). Its experimental designation was DA 990-15. It is

medium-early maturing and has good straw strength. At the time of release it was resistant to powdery mildew, moderately susceptible to BYD and leaf rust, and susceptible to stripe rust and Septoria tritici leaf blotch. It was evaluated as Entry 970 in the UC Regional Cereal Testing program from 1993-1998 and from 2000-2002 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California..

DASH 12

Dash 12 is a hard red spring wheat. It was released by Western Plant Breeders (Westbred LLC) in 2004. It was selected from the cross Express/Serra//Express. Its experimental designation was DA 998-12. It is medium-late maturing, relatively tall (averages 4 inches taller than Anza) and has poor straw strength. At the time of release it was moderately resistant to stripe rust and moderately susceptible to BYD, leaf rust and Septoria tritici leaf blotch. It subsequently became moderately susceptible to stripe rust. It was evaluated as Entry 1341 in the UC Regional Cereal Testing program from 2002-2008 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

ELDON

Eldon is a hard red spring wheat. It was released by Western Plant Breeders in 2001. It was selected from the cross YR/RR-68-91. Its experimental designation was YU 993-68. It is medium-early maturing and has fair straw strength. At the time of release it was moderately susceptible to BYD and leaf rust and susceptible to stripe rust and Septoria tritici leaf blotch. It was evaluated as Entry 1124 in the UC Regional Cereal Testing program from 1997-2003 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

ENANO

Enano is a hard red spring wheat. It was developed Agricultural Products, Arizona. It is medium maturing and has good straw strength. At the time of evaluation it was resistant to stripe rust and leaf rust and susceptible to Septoria tritici leaf blotch. It was evaluated as Entry 597 in the UC Regional Cereal Testing program in 1983 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

EXPRESS

Express is a hard red spring wheat. It was released by Western Plant Breeders (Westbred LLC) in 1991. It was selected from the cross VEE-BH1146. The cross was made in Brazil in 1980, and the F2 was brought to the U.S. by John Gibler in 1982. Its experimental designations were DA 984-034 and PH 984-034. It was developed as a high quality wheat to replace Anza and Yolo in the Sacramento Valley. Express has mid-season maturity (heads about 4 days later than Yecora Rojo and 3-4 days earlier than Yolo) and is a semi-dwarf with medium height (2-4 inches taller than Yecora Rojo, similar in height to Yolo) and good lodging resistance. Express has good milling and baking quality and high grain protein content (averages two points over Anza). At the time of release it was resistant to leaf rust and Septoria tritici leaf blotch and powdery mildew, moderately resistant to stripe rust, and moderately susceptible to BYD. It subsequently became susceptible to stripe rust and moderately susceptible to Septoria tritici leaf blotch. It was evaluated as Entry 788 in the UC Regional Cereal Testing program from 1988-2011 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

EXPRESSO

Expresso is a hard red spring wheat. It was released by WestBred LLC in 2006. It was selected from the cross Express 6*/YR15 Avocet//Express 6*/Madsen. Its experimental designation was DA984-034SRR. It originated from a backcross breeding scheme with the objective of moving stripe rust resistance genes Yr15 and Yr17 into an Express background using molecular markers. Expresso most resembles Express. It is a daylength insensitive semi-dwarf with fair straw strength and medium early maturity. Plant color at booting is blue-green and the flag leaf is erect and twisted. Hairs are present on both the last rachis internode and the auricles. It has white colored chaff and long, awned spikes that are strap shape. The glumes are long and wide, with oblique shoulders. At the time of release it was resistant to stripe rust and leaf rust, moderately resistant to Septoria tritici leaf blotch and powdery mildew, and susceptible to BYD. It subsequently became moderately susceptible to Septoria tritici leaf blotch. It was evaluated as Entry 1500 (as Entry 1535 in the 2006 Intermountain Spring Wheat Test) in the UC Regional Cereal Testing program

from 2006-2011 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas, and in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2009-2010 for spring planting in the intermountain region of northern California.

JEFFERSON
Jefferson is a hard red spring wheat. It was released by the Idaho AES in cooperation with the Oregon and Washington AESs and USDA-ARS in 1998. It was selected from the cross A78240S-2/Westbred 906R = IDO230/ IDO166//Westbred 906R = Fielder *2//Mengavi/8156/6/Moran/3/III-58-1//Frontana/3*Thatcher/5/Frontana/Kenya 58//Norin 10/Brevor/3/Yaqui 54/4/Twin sib/7/Westbred 906R. Its experimental designation was ID 462. It is most similar in appearance to Probrand 751. It has an unpigmented coleoptile, erect juvenile growth, recurved flag leaf and awned, erect, mid-dense head which is white-chaffed at maturity. It is 4 cm taller than Probrand 751 and 12 cm shorter than Amidon. It is about 1 day later in heading than Probrand 751 and 1 day earlier than Amidon. Seed is ovate and plump with kernel type similar to Westbred 936. Jefferson has excellent milling quality. Bread loaf volume is similar to Amidon, Probrand 751, Westbred 926, and Westbred 936. At the time of release it was resistant to stripe rust (adult plant resistance), moderately resistant to the Hessian fly, moderately susceptible to leaf rust, and susceptible to the Russian wheat aphid. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1120 in the UC Regional Cereal Testing program from 1996-2000 and in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-2011 for spring planting in the intermountain region of northern California. *Crop Science 39:296-297 (1999)*

GENERO F81
Genero F81 is a hard red spring wheat. It was developed by the International Maize and Wheat Improvement Center (CIMMYT) in cooperation with the Mexican Ministry of Agriculture (INIA) and released in 1981. It was selected from the cross KVZ/BUHO'S'//KAL/BB. Its experimental designations were CM33027, Veery #3, and D8006. It is medium late maturing and has fair straw strength. At the time of evaluation it was resistant to stripe rust and leaf rust and susceptible to BYD and Septoria tritici leaf blotch. It was evaluated as Entry 491 in the UC Regional Cereal Testing program from 1981-1983 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

GRANDIN
Grandin is a hard red spring wheat. It is medium early maturing and has good straw strength. At the time of evaluation it was resistant to leaf rust. It was evaluated as Entry 891 in the UC Regional Cereal Testing program from 1990-1991 for spring planting in the intermountain area of northern California.

HELENA 554
Helena 554 is a hard red spring wheat. It was received for testing from Helena Chemical Company. It is medium maturing with excellent straw strength. At the time of evaluation it was resistant to stripe rust. It was evaluated as Entry 1451 in the UC Regional Cereal Testing program in 2004 for spring planting in the intermountain area of northern California.

HOLLIS
Hollis is a hard red spring wheat. It was developed by the Agricultural Research Center of Washington State University in cooperation with the Idaho and Oregon AESs and the USDA-ARS and jointly released by the AESs of Washington, Idaho, and Oregon and the USDA-ARS in 2003. It was selected from the cross Butte 86/Copper /4// Tabasi//Makay/3/Minnpro. Its experimental designations were H9500173, K90445, and WA007859. Hollis was released as a replacement for Scarlet in non-irrigated, direct-seeded wheat production systems in the semiarid to intermediate rainfall (<400 mm of average annual precipitation) regions in Washington based on its resistance to the Hessian fly, high grain protein content, high grain weight volume, and superior bread baking quality. Hollis is a tall, semi-dwarf with lax, fusiform heads with white awns and medium-length, white-glumed spikes. The average plant height is 94 cm, 13 cm taller than Scarlet and Tara 2002 and 19 cm taller than Westbred 926. Lodging is similar to that of Westbred 926 and Tara 2002, and lower than that of Scarlet. Heading date is the same as Scarlet, and 2 and 3 days later than Westbred 926 and Tara 2002, respectively. It has large, blocky kernels that are red, hard, and rough textured. Seed has a round, oval, and centered germ with a wide, sometimes dimpled crease, with semi-sharp to sharp cheeks and a medium length, lightly collared brush. At the time of release it was resistant to stripe rust races PST-29, 37, 43, 45, and 78, but moderately resistant or moderately susceptible to PST-98, resistant to Hessian fly biotypes E,

F, and GP, and susceptible to the Russian wheat aphid. It was evaluated as Entry 1531 in the UC Regional Cereal Testing program in 2006 for spring planting in the intermountain area of northern California.

IMURIS T79
Imuris T79 is a hard red spring wheat. It was developed by the International Maize and Wheat Improvement Center (CIMMYT) in cooperation with the Mexican Ministry of Agriculture (INIA) and released in 1979. It was selected from the cross Buckbuck 'S'. Its experimental designation was D8051. It is medium late maturing and has good straw strength. At the time of evaluation it was resistant to stripe rust and leaf rust, moderately resistant to Septoria tritici leaf blotch and susceptible to BYD. It was evaluated as Entry 493 in the UC Regional Cereal Testing program from 1981-1982 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

INIA 66R
Inia 66R is a hard red spring wheat. It was released by the California AES in 1969. It originated as a selection from Inia 66 (Lerma Rojo 64*Sonora 64), differing only in the last (F7) selection. It was developed by the International Maize and Wheat Improvement Center (CIMMYT) in Mexico and was tested in California starting in 1969. Its experimental designations were D6840 and C660014. Inia 66R has slightly higher grain yield potential than Inia 66. Inia 66R has a spring growth habit, is medium-short to medium stature with good lodging resistance and early maturity. The spikes are fully awned with white glumes, semi-lax and nodding. Glume awns are short. Kernels are large, semi-hard, and light red in color. Quality is acceptable for bread-making purposes when flour produced meets normal standards for protein content. At the time of release it was resistant to moderately resistant to powdery mildew and stripe rust, and susceptible to Septoria tritici leaf blotch, BYD, and leaf rust. It was evaluated as Entry 11 in the UC Regional Cereal Testing program from 1969-1984 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California. *Crop Science 25:1129 (1985)*

JEROME
Jerome is a hard red spring wheat. It was developed by the Idaho AES and released in 2004. It was selected from the cross Sunstar II/Westbred 926. Its experimental designation was ID 566. Jerome was released for its superior grain yield and baking quality compared with other irrigated hard red spring cultivars in the intermountain zone of the western United States. It is most similar in appearance to the cultivar Westbred 926. It has an unpigmented coleoptile and an erect seedling growth habit. It has a semi-dwarf plant type, with an average plant stature in Idaho field trials of 82 cm compared with 77 cm for Westbred 936 and 85 cm for Jefferson. Jerome has dark-green foliage with recurved and twisted flag leaves. It has excellent lodging resistance, similar to Westbred 936. Jerome is early maturing, with an average heading date 2 days earlier than Jefferson and 1 day earlier than Westbred 936. The inflorescence is awned, mid-dense, tapered, with glumes that are mid-wide, long, and with elevated shoulders and acuminate beaks. The auricles and anthers are unpigmented. Jerome has a waxy bloom on its glumes at flowering and a bright white chaff color at maturity. Seed is red, ovate, with a shallow, wide crease and rounded cheeks, similar to Sunstar II. The brush on Jerome's seed is medium in length and not collared. Jerome carries the high molecular weight glutenin alleles *Glu-A1b* (2*), *Glu-B1i* (17+18), and *Glu-D1d* (5+10). At the time of release it was resistant to stripe rust and to the Hessian fly and susceptible to Septoria tritici leaf blotch. It was evaluated as Entry 1445 in the UC Regional Cereal Testing program from 2004-2006 for spring planting in the intermountain area of northern California. *Crop Science 45: 1161-1162 (2005)*

KERN
Kern is a hard red spring wheat. It was released by the California AES in 1999. Kern was selected from the cross Tadorna/Inia66//Yecora Rojo/3/Klasic. Its experimental designations were CA830182-0D-2ST-4ST-1ST-3ST and UC 1036. Kern was selected for resistance to Septoria tritici leaf blotch (STB). It is short-statured (about 86 cm, similar in height to Yecora Rojo), with good lodging resistance and mid-season maturity time (heads about 6 days later than Yecora Rojo). It has better lodging resistance and higher yield potential than Yecora Rojo. Kern has good resistance to grain shattering at maturity, not significantly different than Anza, but more resistant then Express and RSI 5. Kern has a mid-dense spike and is fully awned with a straight peduncle. Glumes are white, glabrous with short awns and occasionally show a distinctive blackening (pseudo-black chaff). Grain protein content averages about 1 percentage unit less than Express and Yecora Rojo. It has excellent flour yield, intermediate to low flour water absorption, good mixing properties and loaf volume, and good overall good bread-making quality. Kern contains the high molecular weight glutenins *Glu-A1*: 1, *Glu-B1*: 13+16, and *Glu-D1*: 5+10. Kern carries a major

dominant gene (*Stb4*) for resistance to STB, and is similar in resistance to Express and RSI 5, but significantly more resistant than Yecora Rojo. At the time of release it was resistant to leaf rust, stripe rust, and Septoria tritici leaf blotch, and moderately resistant to BYD. It subsequently became susceptible to stripe rust and Septoria tritici leaf blotch. It was evaluated as Entry 1036 in the UC Regional Cereal Testing program from 1994-2003 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California and in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program in 2010 for spring planting in the intermountain region of northern California..

LEN
Len is a hard red spring wheat. It developed by the Minnesota Agricultural Experiment Station. It is late maturing and has good straw strength. At the time of evaluation it was resistant to leaf rust and stripe rust, and susceptible to BYD. It was evaluated as Entry 790 in the UC Regional Cereal Testing program in 1988 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

MARSHALL
Marshall is a hard red spring wheat. It was developed and released cooperatively by the Minnesota Agricultural Experiment Station and the USDA-ARS in 1982. It was selected from the cross Waldron/Era. Its experimental designations were MN70170R, MN70170, and 7106/9. It is similar in test weight, 2 days earlier in heading, 2 cm shorter in plant height, and more lodging resistant than Era. It is resistant to shattering. The spike is awned, fusiform to oblong, and mid-dense. The glumes are glabrous and white, shoulders are mid-wide and elevated, and beaks are tapering and mid-long. The kernel shape is ovate, mid-size to small, and mid-long to short, with rounded cheeks, and the crease in narrow and shallow to mid-deep. The brush is mid-size to small and mid-long. Marshall has superior bread-making quality. At the time of release it was resistant to stem rust and moderately resistant to leaf rust, loose smut, and ergot. At the time of evaluation it was moderately susceptible to BYD. It was evaluated as Entry 789 in the UC Regional Cereal Testing program in 1988 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California. *Crop Science 23:187 (1983)*

MCKAY
McKay is a hard red spring wheat. It was developed cooperatively by the USDA-ARS and the Idaho AES and released in 1981. It was selected from the cross Moran/Tobari 66/5/Tezanos Pintos Precoz/3*Andes/4/(B61-136 Ab . Sel. 1, Norin 10/Brevor//Centana/3/Conley). Its experimental designation was IDO167. It is an awned, semi-dwarf cultivar with moderately stiff straw. It is intermediate in maturity and heads 2 days later than Borah. Spikes are erect to inclined, oblong, and mid-dense. The glumes are white, mid-long, and mid-wide with rounded to elevated mid-wide shoulders. Beaks are narrow, acuminate, and 2-7 mm long. The kernels are hard, red, mid-long, and ovate with a midsized germ, rounded cheeks, and a narrow mid-deep crease. McKay has excellent milling and baking quality. At the time of release it was resistant to stripe rust and moderately resistant to powdery mildew, stem rust, and leaf rust. It was evaluated as Entry 577 in the UC Regional Cereal Testing program from 1982-1984 for spring planting in the intermountain area of northern California. *Crop Science 24:211 (1984)*

NOMAD
Nomad is a hard red spring wheat. It is medium maturing and has good straw strength. At the time of evaluation it was resistant to leaf rust. It was evaluated as Entry 889 in the UC Regional Cereal Testing program from 1990-1991 for spring planting in the intermountain area of northern California.

NORTHWEST 10
Northwest 10 is a hard red spring wheat. It was received for testing from Germains Seed Co. It is medium maturing and has good straw strength. At the time of evaluation it was resistant to leaf rust and moderately resistant to BYD. It was evaluated as Entry 1140 in the UC Regional Cereal Testing program in 1997 for spring planting in the intermountain area of northern California.

OSLO
Oslo is a hard red spring wheat. It was developed by North American Plant Breeders and released in 1981. It was selected from the cross Sonora 64/Yaqui 50E//Guajalote/3/Inia/4/Ciano/Elgan/Sonora 64. Its experimental designation was NAPB 183-74. It is medium maturing and has good straw strength. At the time of evaluation it was resistant to leaf rust and susceptible to Septoria tritici leaf blotch, stripe rust, and BYD. It was evaluated as Entry 436

in the UC Regional Cereal Testing program from 1980-1984 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

PAVON F76
Pavon F76 is a hard red spring wheat. It was developed by the International Maize and Wheat Improvement Center (CIMMYT) in cooperation with the Mexican Ministry of Agriculture (INIA) and released in 1976. It was selected from the cross VCM//CNO'S'/7C/3/KAL/BB. Its experimental designations were D7842 and C780003. It is medium late maturing and has poor straw strength. At the time of evaluation it was resistant to leaf rust, moderately susceptible to Septoria tritici leaf blotch and susceptible to stripe rust and BYD. It was evaluated as Entry 431 in the UC Regional Cereal Testing program from 1980-1981 and from 2005-2006 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

PEGASUS
Pegasus is a hard red spring wheat. It was bred by Van der Have of the Netherlands and beginning in 1979 was evaluated in New Zealand at Ceres Research Station. It is medium tall with very strong straw and medium late maturity. Spikes are medium long, and tip-awned, with excellent shatter resistance. Kernels are red, hard textured, short and plump, and resistant to black point. It has high flour yield, high Q number and weak flour with low work input. At the time of release it was resistant to stripe rust, leaf rust, Septoria tritici leaf blotch, and powdery mildew. It was evaluated as Entry 808 in the UC Regional Cereal Testing program in 1988 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

PITIC 62
Pitic 62 is a soft red spring wheat. It was developed by the International Maize and Wheat Improvement Center (CIMMYT) in cooperation with the Mexican Ministry of Agriculture (INIA) and released in 1962. It was selected from the cross Yaktana 54//Norin 10/Brevor 26-1C. Its experimental designations were II-7064-1Y-1H-1R-2M and C620005. It is a medium-late, one-gene semi-dwarf averaging 105-110 cm in height with moderately strong straw. The spike is white, fully awned and nodding. The grain is soft, red in color and medium sized. It has very poor bread-making quality but is widely adapted with high yield potential. At the time of release it was resistant to stripe rust, leaf rust, and stem rust, but subsequently became susceptible to all three rust diseases. It was evaluated as Entry 2 in the UC Regional Cereal Testing program in 1980 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California. *Crop Science 12:130 (1972)*

POCO RED
Poco Red is a hard red spring wheat. It was released by Farmers Marketing Corporation and Pillsbury in 1994. It was selected from a male-sterile facilitated recurrent selection population (MSFRS Quality Pop). Its experimental designations were PB BR5738 and CONT BR 5738. It is short with good straw strength and medium maturity. At the time of evaluation it was resistant to stripe rust, moderately resistant to BYD, and susceptible to Septoria tritici leaf blotch and leaf rust. It was evaluated as Entry 829 in the UC Regional Cereal Testing program from 1989-1995 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

POWELL
Powell is a hard red spring wheat. It was released by the Utah AES in 1979. It was selected from cross Roque 66/Delmar//Jaral 66/Delmar. Its experimental designation was UT S15-16-517. It is medium maturing with short (semi-dwarf) white straw. It is similar to Fremont in height and lodging resistance but heads about three days later. The spike is awned, dorso-ventrally compressed, fusiform, mid-dense, erect, and shatter resistant. Glumes are white, glabrous, mid-long and mid-wide, with oblique to elevated shoulders. Beaks are mid-wide, acuminate, and 1-3 mm long. Awns are white and 2-8 cm long. Kernels are red, mid-long, hard and ovate; they have a midsized germ and a mid-wide, mid-deep crease with somewhat angular cheeks; brush is midsized and mid-long. Milling and baking properties are good to excellent. At the time of release it was moderately resistant to moderately susceptible to stripe rust. It was evaluated as Entry 576 in the UC Regional Cereal Testing program in 1982 for spring planting in the intermountain area of northern California. *Crop Science 21:990 (1981)*

PROBRAND 711
Probrand 711 is a hard red spring wheat. It was released by Northrup-King & Co. It was selected from cross

MNII62-61(Insen)/3/Justin//Conley/ND122. It was evaluated as Entry 585 in the UC Regional Cereal Testing program in 1982 for spring planting in the intermountain area of northern California.

PROBRAND 751
Probrand 751 is a hard red spring wheat. It was released by Northrup-King & Co. It was selected from cross Tobari 66/Napo//Nor66/Era/3/Blue Bird/Gallo. It is medium early maturing and has fair straw strength. It was evaluated as Entry 584 in the UC Regional Cereal Testing program from 1982-1989 for spring planting in the intermountain area of northern California.

PROBRAND 771
Probrand 771 is a hard red spring wheat. It was released by Northrup-King & Co in 1979. Its experimental designation was NK775-611. It is medium maturing (slightly later in heading than Probred) and has whitish colored glumes at maturity. Plant height is slightly taller than Probred. It is similar to Probred in milling and baking quality, straw strength and threshability. At the time of evaluation it was resistant to stripe rust, leaf rust and powdery mildew, moderately resistant to BYD, and susceptible to Septoria tritici leaf blotch. It was evaluated as Entry 412 in the UC Regional Cereal Testing program from 1980-1984 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

PROBRAND 775
Probrand 775 is a hard red spring wheat. It was released by Northrup-King & Co in 1984. It was selected from the cross BB#4(L)/2/PSR. Its experimental designation was NK77S4236. It has a spring growth habit and is short-statured with good lodging resistance and medium-early maturity. Grain quality is acceptable for bread-making purposes. At the time of evaluation it was susceptible to moderately susceptible to Septoria tritici leaf blotch, BYD, stripe rust, leaf rust and powdery mildew. It was evaluated as Entry 538 in the UC Regional Cereal Testing program from 1982-1990 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

PROBRED
Probred is a hard red spring wheat. It was released by Northrup-King & Co in 1974. It was selected from the cross Ciano ‘S’//Sonora 64/Klein Rendidor/3/8156. Probred has a spring growth habit and is short-statured with good lodging resistance and early maturity. Plant height is 6 inches shorter than Inia 66R. Spikes are fully awned, fusiform, lax, and inclined. Glumes are long and wide. Shoulders are wanting. The beak is acuminate. Awns are white. Kernels are hard, red, long, and elliptical. Cheeks are rounded with a mid-deep, narrow crease. The brush is large, collared and mid-long. Grain quality is acceptable for bread-making purposes. At the time of release it was resistant to stem rust and leaf rust, moderately resistant to powdery mildew and stripe rust, and susceptible to Septoria tritici leaf blotch and BYD; it subsequently became susceptible to stripe rust and leaf rust. It was evaluated as Entry 243 in the UC Regional Cereal Testing program from 1981-1982, in 1985, and from 1988-1989 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

PROINTA QUEGUAY
Prointa Queguay is a hard red spring wheat. It was developed by Trigen (Minnesota). It was selected from the cross BAGE/HORK//ALDAN'S'//3/CNDR'S'/ALD'S'. It has medium height and late maturity. At the time of evaluation it was resistant to leaf rust, moderately resistant to Septoria tritici leaf blotch, and moderately susceptible to BYD. It was evaluated as Entry 1101 in the UC Regional Cereal Testing program in 1996 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

PROINTA QUINTAL
Prointa Quintal is a hard red spring wheat. It was developed by Trigen (Minnesota). It was selected from the cross MY74/BON/5/DTE/NAN/SOTY//TC*3/SK/3/PPI. It has medium height and medium maturity. At the time of evaluation it was resistant to leaf rust, moderately susceptible to Septoria tritici leaf blotch, and susceptible to BYD. It was evaluated as Entry 1102 in the UC Regional Cereal Testing program in 1996 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

RICH

Rich is a hard red spring wheat. It was released by Farmers Marketing Corporation in 1996. It was selected from a male-sterile facilitated recurrent selection population (Quality HRS Pop). Its experimental designations were FMC BR 8631 and FMC 8631. It has medium maturity and fair straw strength. At the time of evaluation it was resistant to stripe rust, moderately resistant to BYD, and susceptible to Septoria tritici leaf blotch and leaf rust. It was evaluated as Entry 936 in the UC Regional Cereal Testing program from 1992-1996 and in 1998 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

RSI 5

RSI 5 is a hard red spring wheat. It was released by Resource Seeds, Inc. in 1995. It was selected from the cross Tadinia/Probrand 775//23IBWN#76. It is medium maturing with good straw strength. At the time of release it was resistant to moderately resistant to leaf rust, powdery mildew, stripe rust, and Septoria tritici leaf blotch, and moderately susceptible to and BYD; it subsequently became susceptible to stripe rust. It was evaluated as Entry 976 in the UC Regional Cereal Testing program from 1993-1995 and from 1997-2001 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

SAGITTARIO

Sagittario is a hard red spring wheat. It was developed by AllStar Seed Company and released in 1994. It was selected from the cross Adam/Z282. It is medium late maturing and similar in height to Cal Rojo. It is moderately susceptible to stripe rust and susceptible to BYD. It was evaluated in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program in 2007 for spring planting in the intermountain region of northern California and as Entry 1586 in the UC Regional Cereal Testing program in 2008 for late fall planting in the Central Valley and southern desert areas of California.

SCARLET

Scarlet is a hard red spring wheat. It was developed by the Washington Agricultural Research Center in cooperation with the Idaho and Oregon AESs and USDA-ARS and released in 1998. It was selected from the cross Tifton 3725/ Walladay/3/Fielder//Bronz/Koeltz-7941s.5/5/Henry/Karn90, S.90//Burt/Onas 52/3/Lemhi 66/4/Yaktana 54A*4// Norin 10/Brevor 14/6/Tifton 3725/Walladay/3/Fielder//Bronz/Koeltz-7941S.5/7/Tecumseh/5/Tifton 3725/Walladay /4/Bezostaja 1//(14x53-101)/Burt #4/3/Burt/Kenya Farmer 70136. Its experimental designations were K9200106 and WA 7802. It is adapted for production in the semi-arid region (<14 inches average annual precipitation) of eastern Washington as a replacement for Butte 86. It is a tall (averages 72 cm, 5-10 cm taller than Westbred 926 and Spillman), awned, single-gene semi-dwarf with lax, fusiform heads that have white awns and mid-season maturity (heads 2-3 days later that Butte 86 and Westbred 926). It has white glumed spikes, with mid-long to long kernels that are red, hard, and ovate. Seed has a midsize germ, with a mid-wide, mid-deep crease, rounded cheeks, and a midsize, mid-long brush. It has high molecular weight glutenin subunits of 1(1A),7+9(1B) and 5+10(1D). At the time of release it was moderately resistant to stripe rust (adult plant resistance), leaf rust and powdery mildew, and susceptible to the Hessian fly and Russian wheat aphid. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1336 in the UC Regional Cereal Testing program from 2001-2003 for spring planting in the intermountain area of northern California. *Crop Science 39:1255 (1999)*

SERRA

Serra is a hard red spring wheat. It was released by the California AES in 1988. Serra was selected from the cross Yecora Rojo 'S'/Mexifen. Its experimental designation was CM16076. It has a spring growth habit and is medium short-statured with fair lodging resistance (several inches taller than Anza, with more lodging) and medium-late maturity (heading date is about 1 day earlier than for Anza when planted in late fall in the Sacramento Valley and about 2 days earlier than Fieldwin when planted in the spring at Tulelake). Spikes are fusiform, fully awned, lax to mid-dense, and nodding at maturity. Glumes are white, long and wide, with long glume awns. Shoulders are apiculate. Beaks are acuminate. Awns are white and 7-9 cm long. Kernels are red, hard, mid-long and ovate. The crease is shallow and mid-wide. Cheeks are rounded. Brushes are medium. Collars are lacking. Serra has excellent bread wheat quality characteristics and very good yield potential, particularly in the Sacramento and northern San Joaquin Valley areas. At the time of release it was resistant to BYD, stripe rust, and powdery mildew, and susceptible to leaf rust and Septoria tritici leaf blotch. It subsequently became susceptible to stripe rust. It was evaluated as Entry 638 in the UC Regional Cereal Testing program from 1984-2004 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas, and for spring planting in the intermountain region of northern California.

SHASTA
Shasta is a hard red spring wheat. It was released by the California AES in 1976. It was selected from the cross Inia 66/Anza. Its experimental designation was C760002. It was selected to approach the high grain-yielding ability of Anza and good bread-making quality of Inia 66. It is short statured (1-3 cm taller than Inia 66 and 12-14 cm taller than Anza), with fair straw strength and medium maturity (heads 3-5 days earlier than Anza and 3-5 days later than Inia 66). The spike is mid-dense and erect to curving at maturity; peduncle is straight to slightly S-shaped; glumes are cream to white with a short glume awn. The kernels are hard and red, smaller than Inia 66 and equivalent to Anza in size and shape. At the time of release it was moderately resistant to stripe rust, moderately susceptible to BYD, and susceptible to leaf rust and Septoria tritici leaf blotch. It was evaluated as Entry 205 in the UC Regional Cereal Testing program from 1980-1983 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California. *Crop Science 27:613 (1987)*

SOLANO
Solano is a hard red spring wheat. It was released by Westbred LLC in 2004. It was selected from the cross DA993-191/Express. Its experimental designation was WPB DA900-229. It has medium maturity, averages 40 inches in plant height (the same as Anza and 3 inches taller than Yecora Rojo) and has good straw strength. It is moderately susceptible to Septoria tritici leaf blotch and susceptible to stripe rust, leaf rust, and BYD. It was evaluated as Entry 1392 in the UC Regional Cereal Testing program from 2003-2008 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

SPILLMAN
Spillman is a hard red spring wheat. It was released by Washington State University, the Idaho and Oregon AESs, and USDA-ARS in 1989. It was selected from the cross K73579/Borah. Its experimental designations were WA 7075 and K790727. It is the first hard red spring to have the combined potentials for high grain protein production and yield equivalent to higher yielding but lower grain protein cultivars of the Pacific Northwest. It is a semi-dwarf with good straw strength and intermediate maturity (similar in heading to Fieldwin). Spikes are white-glumed and awned. Milling and bread-baking quality properties are satisfactory. At the time of release it was resistant to stripe rust, leaf rust, stem rust, and powdery mildew, and susceptible to common bunt and Hessian fly. It was evaluated as Entry 764 (1987-1991) and as Entry 1006 (1993-1995) in the UC Regional Cereal Testing program for spring planting in the intermountain area of northern California.

SPRITE
Sprite is a hard red spring wheat. It was developed by North American Plant Breeders and released in 1989. Its experimental designation was NA 681-17. It is medium-early maturing and has poor straw strength. At the time of release it was moderately susceptible to leaf rust. It was evaluated as Entry 767 in the UC Regional Cereal Testing program from 1987-1991 for spring planting in the intermountain area of northern California.

STANDER
Stander is a hard red spring wheat. It was released by Resource Seeds, Inc. in 1998. It was selected from the cross Cleo/2/Inia/UC Septoria Resist 3/Probrand 775. Its experimental designation was RSI 95W10108. It is medium maturing with excellent straw strength. At the time of release it was resistant to stripe rust, moderately resistant to Septoria tritici leaf blotch and powdery mildew, and moderately susceptible to leaf rust and BYD. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1130 in the UC Regional Cereal Testing program from 1997-2004 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

STELLAR
Stellar is a hard red spring wheat. It was released by Resource Seeds, Inc. in 2004. It was selected from the cross Tadorna/Probrand 775//Cleo/2Inia 66/3/Klasic. Its experimental designation was RSI 96WV51505. It is medium maturing with good straw strength. At the time of release it was resistant to Septoria tritici leaf blotch and leaf rust and moderately resistant to stripe rust and BYD. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1154 in the UC Regional Cereal Testing program from 1998-2001 and in 2004 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

STOA
Stoa is a hard red spring wheat. It is early maturing and has poor straw strength. It was evaluated as Entry 730 in the UC Regional Cereal Testing program from 1986-1989 for spring planting in the intermountain area of northern California.

SUCCESS
Success is a hard red spring wheat. It was developed by North American Plant Breeders. It was selected from the cross Era/3/Polk/Tobari//Fletcher. It was evaluated as Entry 729 in the UC Regional Cereal Testing program in 1986 for spring planting in the intermountain area of northern California.

SUMMIT
Summit is a hard red spring wheat. It was released by Resource Seeds, Inc. in 2001. It was selected from the cross Express//Tadorna/Probrand 775. Its experimental designation was RSI 96WV52305. It has medium maturity, averages 40 inches in plant height (the same as Anza and 3 inches taller than Yecora Rojo), and has excellent straw strength. At the time of release it was resistant to leaf rust, moderately resistant to Septoria tritici leaf blotch and stripe rust, and moderately susceptible to BYD; it subsequently became susceptible to stripe rust and Septoria tritici leaf blotch. It was evaluated as Entry 1155 in the UC Regional Cereal Testing program from 1998-2008 and in 2010 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

SUNSTAR 2
Sunstar 2 is a hard red spring wheat. It was released by Sunderman Breeding Co. in 1991. It is a selection from Westbred 906R. It is early maturing and has good straw strength (slightly later in maturity and shorter in stature than Westbred 906R). The flag leaf usually is erect and twisted. Plant color is blue green with a waxy bloom present on the flag leaf sheath. Spikes are white-glumed and awned. Bushel weight is 1-2 lbs heavier than for Westbred 906R. It was evaluated as Entry 942 in the UC Regional Cereal Testing program from 1992-1995 for spring planting in the intermountain area of northern California.

SUNSTAR KING
Sunstar King is a hard red spring wheat. It was released by Sunderman Breeding Co. in 1999. It was selected from the cross SDM492/2*Sunstar 1. Its experimental designation was SDM 50032. It is early maturing. At the time of release it was resistant to stripe rust and moderately susceptible to leaf rust and BYD. It was evaluated as Entry 1193 in the UC Regional Cereal Testing program from 1998-2001 for spring planting in the Intermountain area of northern California.

TADINIA
Tadinia is a hard red spring wheat. It was released by the California AES in 1984. It was selected from the cross Tadorna/Inia 66. Its experimental designation was CA70353-60D-3S-4D. Tadorna, a European red winter wheat, was originally selected as a parent because of resistance to stripe rust at Davis. Inia 66, the other parent, is a hard red spring wheat released in Mexico in 1966 and subsequently widely grown in California. In 1975, a severe epiphytotic of Septoria tritici leaf blotch occurred in the field at Davis, and resistance was noted in the F4 lines from the cross Tadorna/Inia 66. Tadinia originated from one of the selected lines. Tadinia has a spring growth habit and is medium short-statured (several inches taller than Anza) with good lodging resistance and medium maturity (1-3 days earlier in heading than Anza). Spikes are fusiform, fully awned, mid-dense, and somewhat inclined at maturity. Peduncles are straight. Glumes are white, long and wide, with short awns. Shoulders are elevated. Beaks are acuminate. Awns are white and 6-8 cm long. Kernels are red, hard, mid-long and ovate. The crease is shallow and mid-wide. Cheeks are rounded. Brushes are short and collars are lacking. Tadinia is not desirable for bread-making because of weak gluten and low protein content. It has good milling characteristics, however, and, like Anza and Yolo, is acceptable for general purpose flour. At the time of release it was resistant to Septoria tritici leaf blotch, stripe rust, and powdery mildew, and susceptible to moderately susceptible to leaf rust and BYD. It was evaluated as Entry 544 in the UC Regional Cereal Testing program from 1982-1994 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California. *Crop Science 30: 1366 (1990)*

TAMMY

Tammy is a hard red spring wheat. It was developed by World Seeds, Inc and released in 1986. It was selected from the cross WS1812 'S'/Flaminio. Its experimental designation was MP 325. It has midseason maturity, is mid-tall (one gene semi-dwarf) with good straw strength. Spikes are awned, oblong, mid-dense, inclined, and resistant to shattering. Awns are white, 7 cm long. Glumes are glabrous, white, 10 mm long and mid-wide with oblique, narrow shoulders. Beaks are acuminate. Kernels are red, hard, long and ovate. The crease is mid-deep and mid-wide. Cheeks are rounded. Brushes are midsize and collars are lacking. At the time of release it was resistant to leaf rust, powdery mildew and stem rust, moderately susceptible to Septoria tritici leaf blotch and stripe rust, and susceptible to BYD. It was evaluated as Entry 679 in the UC Regional Cereal Testing program in 1985 and 1987 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

TANORI 71

Tanori 71 is a hard red spring wheat. It was developed by the International Maize and Wheat Improvement Center (CIMMYT) in cooperation with the Mexican Ministry of Agriculture (INIA) and released in 1971. It was selected from the cross Sonora 64/2/Ciano 'S'/Inia 66. Its experimental designations were D7189 and C710004. It is short statured (6-10 cm taller than Anza) and early maturing (similar to Inia 66R). It has good straw strength and shatter resistance. The spikes are fully awned with white glumes and dense spikelets. Quality is acceptable for bread flour production. At the time of release it was resistant to stripe rust. It was evaluated as Entry 109 in the UC Regional Cereal Testing program from 1980-1981 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

TARA 2000

Tara 2000 is a hard red spring wheat. It was developed by the Agricultural Research Center of Washington State University in cooperation with the Idaho and Oregon AESs and USDA-ARS and jointly released by the Washington, Idaho, and Oregon AESs and the USDA-ARS in 2002. It was selected from the cross Kodiak/Spillman//Wesbred 906R. Its experimental designations were WA007824, K9300092, and K88437. It was intended as a replacement for Westbred 926 in intermediate to high rainfall regions (400mm) for non-irrigated wheat production regions of Washington based on it tolerance to Hessian fly, high grain yield, and superior end-use quality. Tara 2000 is an intermediate height semi-dwarf with lax, fusiform heads with white awns and medium length, white glumed spikes with elliptical kernels that are red, hard, and smooth texture. Seed has a round germ with a narrow, shallow crease, rounded cheeks, and a short, non-collared brush. At the time of release Tara 2000 had moderate high temperature adult plant resistance to stripe rust, moderate adult plant resistance to leaf rust, tolerance to Hessian fly biotypes E, F, and GP, and susceptibility to Russian wheat aphid. It was evaluated as Entry 1337 in the UC Regional Cereal Testing program from 2001-2002 for spring planting in the intermountain area of northern California. *Crop Science 42: 1746-1747 (2002*)

TEMPO

Tempo is a hard red spring wheat. It was released by Resource Seeds, Inc. in 2005. It was selected from the cross Express/5/Tadorna/4/VS73.600/MRL/3/BOW//YR/TRF. Its experimental designation was RSI 96WV52303A. It is about 3 cm shorter than Summit and about 10 cm shorter than Blanca Grande, with better lodging resistance than either cultivar. It is similar in heading to Summit and Blanca Grande. It has a yellow green plant color and a recurved flag leaf at the boot stage. The stem has anthocyanin present as well as a waxy bloom. The auricles and last internode of the stem are hairy, and the peduncle is semi-erect. The spikes are awned, inclined, mid-dense and strap shaped, with tan glumes that are long and wide, having apiculate shoulders and an acuminate beak. Seed is hard, red, elliptical, with a rounded cheek and long brush, a crease that is narrow and mid-deep, and midsize germ. At the time of release it was resistant to leaf rust and BYD and moderately resistant to Septoria tritici leaf blotch and stripe rust. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1476 in the UC Regional Cereal Testing program from 2005-2006 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

TESIA T79

Tesia T79 is a hard red spring wheat. It was developed by the International Maize and Wheat Improvement Center (CIMMYT) in cooperation with the Mexican Ministry of Agriculture (INIA) and released in 1979. It was selected from the cross PL/3/Inia66/CNO//CAL/4/BJY 'S'. Its experimental designation was D8053. It is medium maturing with good straw strength. At the time of release it was resistant to stripe rust and leaf rust, moderately susceptible to Septoria tritici leaf blotch, and susceptible to BYD. It was evaluated as Entry 495 in the UC Regional Cereal Testing

program from 1981-1982 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

TOPIC
Topic is a hard red spring wheat. It was developed by World Wide Wheat. It was selected from a male sterile facilitated recurrent selection population (MSFRS DR Quality - HFR Selection). Its experimental designation was BR 3666. It is medium maturing with fair straw strength. At the time of release it was moderately susceptible to leaf rust and susceptible to BYD, stripe rust and Septoria tritici leaf blotch. It was evaluated as Entry 1204 in the UC Regional Cereal Testing program in 1999 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

UI WINCHESTER
UI Winchester is a hard red spring wheat. It was developed by the Idaho AES and released in 2006. It was selected from the cross WPB926/WA7702. Its experimental designation was ID0578. It is medium early maturing and has poor straw strength. At the time of release it was resistant to stripe rust. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1529 in the UC Regional Cereal Testing program in 2006 and in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2009-2011 for spring planting in the intermountain region of northern California.

VANCE
Vance is a hard red spring wheat. It was developed cooperatively by the Minnesota AES and the USDA-ARS and released in 1989. It was selected from the cross ND560/MN7595. Its experimental designation was MN 82354. It is medium late maturing and has fair straw strength (similar to Marshall in days to head and lodging resistance, but is about 4 cm taller). It possesses at least a 0.5% increase in protein content and superior bread-making quality compared to Marshall. The spike is awned, fusiform to oblong, and mid-dense. The glumes are glabrous and white, shoulders are wide and elevated, and beaks are tapering and mid-long. The kernel shape is ovate, midsize, with rounded cheeks, and the crease is narrow and mid-deep. The brush is midsize to small and mid-long. At the time of release it was resistant to leaf rust and stem rust and moderately resistant to loose smut and ergot. It was evaluated as Entry 892 in the UC Regional Cereal Testing program from 1990-1991 for spring planting in the intermountain area of northern California. *Crop Science 30:749 (1990)*

VANDAL
Vandal is a hard red spring wheat. It was released by the University of Idaho and USDA-ARS in cooperation with the Washington AES in 1991. It was selected from the cross Cowbird sib/5/McCall/Bajio 66/4/Tezanos Pintos Precoz/Sonora 64/3/Lee//No. 58/Thatcher. Its experimental designations were A78540S-20 and ID0341. It is a semi-dwarf with good lodging resistance, similar in height and tillering response to Westbred 926, but with higher grain protein content. It is late maturing, and heads about 6 days later than Westbred 926. Spikes are awned, mid-dense, with short, wide glumes that are glabrous, with oblique shoulders and acuminate beaks. Chaff color is white to yellow-white at maturity. Kernels are elliptical with angular cheeks and a short, uncollared brush. The crease is wide and shallow. Vandal has good baking quality. At the time of release it was resistant to stripe rust (adult plant resistance) and leaf rust, and susceptible to the Russian wheat aphid and Hessian fly. It was evaluated as Entry 1008 in the UC Regional Cereal Testing program in 1993 for spring planting in the intermountain area of northern California. *Crop Science 32: 833-834 (1992)*

W444
W444 is a hard red spring wheat. It was developed by Germain's Seeds. It was selected from the cross Inia*((Sonora 64*(TZPP*Yaqui 54)). Its experimental designation was C800056. It is medium maturing and has good straw strength. At the time of release it was resistant to stripe rust and susceptible to Septoria tritici leaf blotch. It was evaluated as Entry 272 in the UC Regional Cereal Testing program from 1980-1981 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

WAMPUM
Wampum is a hard red spring wheat. It was released by the Washington AES. It was selected from the cross Henry/Karn Sel. Fel90//Awned Onas/CI 12731/3/CI 1370. It is medium maturing and has poor straw strength. It was evaluated as Entry 532 in the UC Regional Cereal Testing program from 1981-1984 for spring planting in the

intermountain area of northern California.

WARED
Wared is a hard red spring wheat. It was developed cooperatively by the Washington AES and the USDA-ARS and released in 1974. It was selected from the cross Thatcher/2*Supreza/3/Frontana//Kenya 58/Newthatch/7/Pembina// Frontana/5*Thatcher/6/Mida//Kenya 117A/2*Thatcher/3/Frontana/4*Thatcher/4/III-58-4/5/Kenya 58/Newthatch //3*Lee. Its experimental designations were MN 206264 and II-62-64. It is a semi-dwarf with midseason to late maturity. Era and Fletcher, released in Minnesota, are sister selections. It has white straw, awns, and glabrous glumes. Kernels are red, short, hard, and ovate, and the brush is midsized. At the time of release it was resistant to powdery mildew and many races of stem rust and leaf rust, and was moderately resistant to stripe rust. It was evaluated as Entry 252 in the UC Regional Cereal Testing program from 1982-1984 for spring planting in the intermountain area of northern California. *Crop Science 14:910 (1974)*

WB-FUZION
WB-Fuzion is a hard red spring wheat. It was developed by WestBred, a unit of Monsanto, and released in 2010. It was derived from the cross Hank/McNeal. Its experimental designation was BZ901-717. It has good milling and baking quality. WB-Fuzion is a medium maturity, hollowed stemmed, one gene semidwarf. The head is strap shaped, mid-dense, awned and slightly inclined at maturity. The plant color is blue-green and the leaves and stem have a waxy bloom. The chaff color is red. The glume is acuminate and the shoulders are square. The seed is hard and red and ovate with rounded cheeks. The brush is large with medium length hair and not collared. The embryo is large, and the crease is narrow and shallow. WB-Fuzion has intermediate tolerance to the Hessian fly. It is susceptible to stripe rust. It was evaluated in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program in 2011 for spring planting in the intermountain region of northern California. *(Washington Crop Improvement Association website: http://washingtoncrop.com/seed/varieties.asp*)

WESTBRED 906R
Westbred 906R is a hard red spring wheat. It was released by Western Plant Breeders. It was selected from a male sterile facilitated recurrent selection population (parentage unknown). It is early maturing and has good straw strength. It was evaluated as Entry 423 in the UC Regional Cereal Testing program from 1980-1984 and from 1987-1990 for spring planting in the intermountain area of northern California.

WESTBRED 911
Westbred 911 is a hard red spring wheat. It was released by Western Plant Breeders in 1981. It was selected as an F2 plant in 1976 from the male sterile facilitated recurrent selection (MSFRS) F2 population MSFRS Wheat Germplasm Composite Cross A-1976 released by Rex Thompson at the University of Arizona, Mesa Station. Westbred 911 originated as an individual plant selection designated 225R-WC made in 1979 from the bulk F6. Its experimental designation was WPB 225-R. Westbred 911 has a spring growth habit and is short-statured with good lodging resistance and late maturity. It has acceptable milling and bread baking quality, but is not quite as good as Yecora Rojo. It has semi-solid straw (the stem is solid until shortly before grain maturity; thereafter it is hollow). Spikes are fusiform, fully awned, mid-dense, very lax, very long, and inclined at maturity. Glumes are white, long, and wide. Shoulders are oblique. Beaks are acuminate. Awns are white and 10-12 cm long. Kernels are red, hard, long, and elliptical. The crease is mid-deep and mid-wide. Cheeks are rounded. Brushes are long and collars are lacking. At the time of release it was resistant to powdery mildew, moderately resistant to BYD and stripe rust, and susceptible to Septoria tritici leaf blotch and leaf rust. It was evaluated as Entry 521 in the UC Regional Cereal Testing program from 1981-1987 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

WESTBRED 926
Westbred 926 is a hard red spring wheat. It was released by Western Plant Breeders in 1987. It was intended as a replacement for Westbred 906R. It is an awned semi-dwarf, similar in height and tillering response to Vandal, with good lodging resistance and early-intermediate maturity. It has very good milling and baking characteristics. At the time of release it was resistant to stem rust, stripe rust, powdery mildew, leaf rust, and Hessian fly, moderately susceptible to BYD, and susceptible to Septoria tritici leaf blotch, glume blotch, and bacterial leaf blight. It subsequently became moderately susceptible to stripe rust. It was evaluated as Entry 765 in the UC Regional Cereal Testing program from 1987-1995 for spring planting in the intermountain area of northern California.

WESTBRED 936
Westbred 936 is a hard red spring wheat. It was released by Western Plant Breeders in 1992. It was selected from a male-sterile facilitated recurrent selection population (906R Alpha-84). Its experimental designation was PH 986-61. It is a replacement for Westbred 906R and Westbred 926. It is an awned semi-dwarf, similar in height to Westbred 926 with good lodging resistance and intermediate maturity. It is not sensitive to Avenge wild oat herbicide. At the time of release it was resistant to stripe rust and stem rust, moderately susceptible to leaf rust, powdery mildew and Hessian fly and susceptible to Septoria tritici leaf blotch. It subsequently became susceptible to stripe rust. It was evaluated as Entry 867 in the UC Regional Cereal Testing program from 1990-2006 and in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program in 2011 for spring planting in the intermountain region of northern California.

WESTBRED DISCOVERY
Westbred Discovery is a hard red spring wheat. It was released by Western Plant Breeders. It is medium maturing and has poor straw strength. It was evaluated as Entry 766 in the UC Regional Cereal Testing program from 1987-1989 for spring planting in the intermountain area of northern California.

WESTBRED RAMBO
Westbred Rambo is a hard red spring wheat. It was released by Western Plant Breeders. It is medium maturing and has good straw strength. At the time of release it was resistant to leaf rust. It was evaluated as Entry 856 in the UC Regional Cereal Testing program from 1988-1991 for spring planting in the intermountain area of northern California.

YOLO
Yolo is a hard red spring wheat. It was released by the California AES in 1981. It is a selection from the cross Bluebird 'S'/Anza. Its experimental designation was UC 353. Yolo has a spring growth habit and short-stature (averaging about 36 inches) with good lodging resistance and medium-late maturity (similar to Anza). Its grain quality characteristics are similar to Anza (excellent milling characteristics, but low in protein with weak gluten; unsuitable for bread-making purposes, but satisfactory for use in general purpose flours). The main attribute of Yolo is its significantly higher grain yield than Anza. Spikes are fusiform, fully awned, dense and inclined at maturity. Glumes are white, long and wide, with long glume awns. Shoulders are square. Beaks are acuminate. Awns are white and 7-9 cm long. Kernels are red, hard, mid-long, and ovate. Creases are shallow and narrow. Cheeks are rounded. Brushes are long. Collars are lacking. At the time of release Yolo was resistant to moderately resistant to powdery mildew, BYD, and stripe rust, and moderately susceptible to Septoria tritici blotch and leaf rust. It subsequently became susceptible to stripe rust and moderately susceptible to BYD. It was evaluated as Entry 353 in the UC Regional Cereal testing program from 1980-2003 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

ZEKE
Zeke is a hard red spring wheat. It was released by Western Plant Breeders in 1999. Its experimental designation was BZ987-331. It is an early maturing (2 days later than Westbred 926 and 5 days earlier than McNeal), awned, semi-dwarf. Grain protein levels are similar to Hi-Line. It is susceptible to stripe rust, BYD, and root rot. It was evaluated as Entry 1139 in the UC Regional Cereal Testing program from 1997-1999 for spring planting in the Intermountain area of northern California.

CULTIVAR ARCHIVES (Cultivars previously evaluated by UC Small Grains Program)
HARD WHITE WHEAT

ALTA BLANCA
Alta Blanca is a hard white spring wheat. It was developed by the University of Idaho. It was selected from the cross Jefferson/2*IDO470. Its experimental designation was ID0628. It is a tall wheat intended for rain-fed production. It has very good straw strength. At the time of release it was moderately resistant to stripe rust and susceptible to Hessian fly. It was evaluated as Entry 1525 in the UC Regional Cereal Testing program in 2006 for spring planting

in the intermountain region of northern California.

BLANCA GRANDE
Blanca Grande is a hard white spring wheat. It was released by Resource Seeds, Inc. in 2001. It was selected from the cross Express//Cleo/2Inia66/4/PB775. Its experimental designation was RSI 96WV53620. It has medium early maturity, averages 39 inches in plant height (one inch shorter than Anza) and has fair straw strength. At the time of release it was resistant to stripe rust, moderately resistant to Septoria tritici leaf blotch and BYD, and moderately susceptible to stripe rust and leaf rust. It subsequently became susceptible to stripe rust and Septoria tritici leaf blotch and moderately susceptible to powdery mildew. It was evaluated as Entry 1156 in the UC Regional Cereal Testing program from 1998-2010 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California and in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-2009 for spring planting in the intermountain region of northern California.

DELANO
Delano is a hard white spring wheat. It was released by Arizona Plant Breeders in 1994. Its experimental designation was APB W10-8. It is early maturing. At the time of release it was moderately susceptible to BYD and susceptible to Septoria tritici leaf blotch and leaf rust. It was evaluated as Entry 937 in the UC Regional Cereal Testing program from 1992-1994 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

GOLDEN SPIKE
Golden Spike is a hard white winter wheat. It was developed by the Utah AES and released in 1999. It was selected from the cross Arbon/Hansel//Hansel/ID0281. Its experimental designation was UT1944-158. Golden Spike was released to provide a high-quality, hard white winter wheat with high yields when grown under dryland conditions, where dwarf bunt can be severe. The juvenile growth habit is semi-erect and coleoptile anthocyanin is absent. Heading date is the same as Boundary, and the flag leaf is erect and twisted. Stems are hollow, and the mature plant, at an average height of 78 cm, is generally about 5 cm taller than Boundary and 12 cm shorter than Weston. It has good straw strength. Golden Spike has awned, bronze chaffed, tapering, mid-dense, and inclined spike characteristics. The kernel is elliptical, has rounded creeks, with a mid-wide, mid-deep seed crease, and medium-sized brush that is not collared. The kernel phenol reaction is fawn except for the ends of the kernels, which are light brown. At the time of release it was resistant to dwarf bunt, moderately resistant to snowmolds, and moderately susceptible to stripe rust and leaf rust. It was evaluated as Entry 1387 in the UC Regional Cereal Testing program from 2003-2006 for fall planting in the intermountain region of northern California. *Crop Science 42:1376-1377 (2002)*

ID377S
ID377S is a hard white spring wheat. It was released by the Idaho AES in cooperation with the USDA-ARS in 1995. It was selected from the cross Gallo/Yecora reselection/3/Aurora//Kalyansona/Bluebird 4/Norin 10/Brevor//Baart/Onas. Its experimental designation was ID377S. It is a semi-dwarf and has intermediate height, with fair to poor straw strength, and intermediate maturity (flowers one day earlier than Penawawa). It is similar to Fieldwin in appearance. It has exceptionally good Asian noodle quality; bread quality is inferior to Klasic. It has a green coleoptile and erect juvenile growth habit. Spikes are mid-dense, erect, and awned. Glumes are acuminate, narrow, and medium in length with elevated shoulders. Kernels are hard white and elliptical in shape with rounded cheeks and a small germ. The crease is mid-wide and shallow. At the time of release it was resistant to stripe rust, leaf rust and stem rust and susceptible to powdery mildew, Hessian fly and Russian wheat aphid. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1051 in the UC Regional Cereal Testing program from 1994-1996 and in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-2009 for spring planting in the intermountain region of northern California. *Crop Science 37: 1393 (1997)*

KLASIC
Klasic is a hard white spring wheat. It was released by Northrup-King & Co. in 1981. It was selected from the cross Klein Rendidor/2/Sonora//Inia/3/Ciano/4/Yecora. Its experimental designation was NK77S1817. Klasic has a spring growth habit and is short-statured with good lodging resistance and medium-early maturity. When planted in the spring it heads about 6 days earlier than Fieldwin. Klasic has excellent milling and bread-making quality attributes.

Spikes are fully awned, fusiform, mid-dense, and inclined. Glumes are white, long and wide, with long glume awns. Shoulders are elevated. Beaks are acuminate. Awns are white and 10-12 cm long. Kernels are white, hard, long and ovate. Creases are shallow and mid-wide. Cheeks are rounded. Brushes are long and collars are lacking. At the time of release Klasic was resistant to moderately resistant to powdery mildew and stripe rust, moderately susceptible to leaf rust, and susceptible to Septoria tritici leaf blotch and BYD. It subsequently became susceptible to stripe rust. It was evaluated as Entry 415 in the UC Regional Cereal Testing program from 1980-2003 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas, and for spring planting in the intermountain region of northern California.

LOCHSA

Lochsa is a hard white spring wheat. It was developed by the Idaho AES and released in 2006. It was selected from the cross Westbred 936/Maya 74//Sunstar I. Its experimental designation was ID0597. It was released for its superior grain yield and baking quality compared with previous hard white wheat cultivars in the intermountain zone of the western United States. Lochsa is most similar in appearance to the cultivar Jefferson. It has mid-maturity, with an average heading date the same as Jefferson and 1 day later than Westbred 936. It has an unpigmented coleoptile and an erect seedling growth habit. It has a semi-dwarf plant type, with an average plant height of 86 cm compared with 85 cm for Jefferson and 89 cm for the tall semi-dwarf cultivar Lolo. It has good straw strength. Lochsa has dark green foliage with recurved and non-twisted flag leaves. The inflorescence is awned, mid-dense, tapered, with glumes that are mid-wide, long, with elevated shoulders and acuminate beaks. The auricles and anthers are unpigmented. It has a bright white chaff color at maturity. Seed is ovate, with a shallow, wide crease and rounded cheeks. The brush is medium in length and not collared. Lochsa has large seed, averaging 42 mg per kernel, greater than Jefferson (36 mg per kernel) but not significantly different from Lolo (43 mg per kernel). Lochsa carries the high molecular weight glutenin alleles Glu-A1b (2*), Glu-B1i (17+18), and Glu-D1d (5+10). At the time of release it was moderately resistant to stripe rust, susceptible to Hessian fly and had higher grain protein content than hard white spring cultivars then available. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1448 in the UC Regional Cereal Testing program from 2005-2006 for spring planting in the intermountain region of northern California.

LOLO

Lolo is a hard white spring wheat. It was developed by the Idaho AES and released in 2003. It was selected from the cross Oasis 86/ID0377. Its experimental designation was ID 533. It is a semi-dwarf wheat with excellent grain yield and end-use quality for alkaline and Chinese style noodles. Lolo is most similar in appearance to ID377S. It has medium maturity (flowers one day later than ID377S.). Lolo has an unpigmented coleoptile and erect juvenile growth habit. It has an erect flag leaf and an awned, curved mid-dense head that is white-chaffed at maturity. It is 90 cm tall, 10 cm taller than Westbred 936, and has fair straw strength. Seed is hard white, ovate, and plump. The kernel shape is similar to ID377S, only slightly less elongated. At the time of release it was resistant to stripe rust and leaf rust (adult plant resistance) and susceptible to the Hessian fly. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1192 in the UC Regional Cereal Testing program in 1998 and from 2000-2006 for spring planting in the intermountain region of northern California. *Crop Science 43: 734-735 (2003)*

MACON

Macon is a hard white spring wheat. It was developed by the Agricultural Research Center of Washington State University in cooperation with the University of Idaho, Oregon State University, and the USDA-ARS and jointly released by Washington, Idaho, and Oregon AESs and the USDA-ARS in 2002. It was selected from the cross Serra/Westbred 926//Tanager S/Pewee S. Its experimental designation was WA007899. Macon is targeted for production in the intermediate to high rainfall (>400 mm of average annual precipitation), non-irrigated wheat production regions of Washington State on the basis of its resistance to the Hessian fly and its superior bread and noodle making qualities. It is an awned semi-dwarf with mid-season maturity (flowers one day earlier than ID377S and 3 days earlier than Winsome), white straw and white glumes. The average plant height of Macon is 71 cm, 1 cm shorter than ID377S and 2 cm taller than Winsome. Lodging is similar to Winsome and ID377S. Macon has an erect juvenile plant growth habit, and flag leaves are recurved and twisted. It has lax, tapering heads with white awns, and white glumes that are short and wide with square shoulders and obtuse beaks. Kernels are elliptical, white, hard, with a smooth texture. Seed of Macon has a round germ with a narrow, shallow crease, rounded cheeks, and a short, non-collared brush. It has acceptable noodle color, soft noodle texture and outstanding bread baking quality. Loaf volumes are significantly higher than ID377S and Winsome and similar to Klasic. It contains the

high molecular weight glutenin subunits of 2*(1A), 17+18(1B), and 5+10(1D). At the time of release it was resistant to the Hessian fly, moderately resistant to stripe rust, and susceptible to the Russian wheat aphid. It was evaluated as Entry 1381 in the UC Regional Cereal Testing program from 2002-2003 for spring planting in the intermountain region of northern California. *Crop Science 43:1561-1563 (2003)*

OTIS

Otis is a hard white spring wheat. It was developed and jointly released by the Agricultural Research Center of Washington State University in cooperation with Idaho and Oregon AESs and the USDA-ARS in 2005. It was selected from the cross ID377S/3/Tanager 'S'/Torim 73//Spillman. Its experimental designation was WA 7931. Otis is targeted for production in the semiarid and intermediate rainfall (<400 mm of average annual precipitation), non-irrigated wheat production regions of Washington based on its high grain yield potential, high-temperature adult-plant resistance to local races of stripe rust, partial resistance to the Hessian fly, and superior dual purpose end-use quality for making noodle and bread products. It is an awned, tall semi-dwarf, with white straw and mid-season maturity (heads 3 days later than Macon and 1 day later than ID377S and Lolo). The average plant height is 84 cm, 9 cm taller than Macon and ID377S and 7 cm taller than Lolo. Lodging is similar to Macon, ID377S, and Lolo. It has white glumes with narrow, acuminate shoulders, and narrow beaks. Kernels are ovate, white, and hard in texture. Seed has a midsize germ with a narrow, shallow crease, rounded cheeks, and a short, non-collared brush. Otis has high molecular weight glutenin subunits of 1 (1A), 6/7+8 (1B), and 5+10 (1D) and far better bread making quality than ID377S. It had excellent noodle color and texture. It is a partial waxy type, making it suitable for producing different types of noodles than Macon (normal starch) is suited for. At the time of release it was resistant to stripe rust (high-temperature adult-plant resistance), had heterogeneous resistance to Hessian fly biotypes E, F and GP, and was susceptible to the Russian wheat aphid. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1489 in the UC Regional Cereal Testing program from 2005-2008 for spring planting in the intermountain region of northern California and for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California. *Crop Science 46:1386-1387 (2006)*

PHOENIX

Phoenix is a hard white winter wheat. It was released jointly by the California AES and the University of Melbourne in 1981. It was selected at the Agricultural Research Institute, Wagga Wagga, Australia from the cross (Yaktana 54//Norin 10Brevor/3/3*Andes/4/Norin 10/Brevor//Lerma Rojo, WW15)*2/5/(WW80, Penjamo 62/4*Gabo 56 /Tezanos Pintos Precoz/Nainari 60). WW15 is very similar to the cultivar Anza. Its experimental designations were WW33 and C810002. Phoenix has a winter growth habit and is short-statured with good lodging resistance. It has medium-late maturity, similar to Anza, when planted from early- to mid-fall in the Central Valley. When planted later than January 1, Phoenix becomes progressively later than Anza as the date of planting is delayed, and may not head if planted in February or March. Spikes are fully awned, fusiform, mid-dense, and erect at maturity. Glumes are white, long and wide, with short glume awns. Shoulders are square. Beaks are acuminate. Awns are white and 9-11 cm long. Kernels are white, hard, mid-long, and ovate. Creases are shallow and narrow. Cheeks are rounded. Brushes are long and collars are lacking. The grain quality of Phoenix is similar to Anza, with low protein content and weak gluten strength. Milling quality is good, with high flour yields. Flour is best suited for general purpose uses rather than bread-making. At the time of evaluation it was resistant to moderately resistant to powdery mildew, stripe rust, and BYD, and susceptible to moderately susceptible to leaf rust and Septoria tritici leaf blotch. It was evaluated as Entry 221 in the UC Regional Cereal Testing program from 1982-1990 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California. *Crop Science 25:573 (1985)*

PIMA 77

Pima 77 is a hard white spring wheat. It was developed by the International Maize and Wheat Improvement Center (CIMMYT) in cooperation with the Mexican Ministry of Agriculture (INIA) and released in 1977. It was selected from the cross 21931/CH53//2*LR64/3/8156/4/NAR59'S'. It is medium late maturing and has fair straw strength. Its experimental designation was D8002. At the time of evaluation it was resistant to stripe rust and leaf rust, moderately susceptible to Septoria tritici leaf blotch, and susceptible to BYD. It was evaluated as Entry 490 in the UC Regional Cereal Testing program from 1981-1982 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

PLATA

Plata is a hard white spring wheat. It was released by Resource Seeds, Inc. in 2001. It was selected from the cross

Tadorna//PB775//Express. Its experimental designation was RSI 96WV54013-W. It has medium maturity, averages 40 inches in plant height (one inch taller than Blanca Grande) and has excellent straw strength. At the time of release it was resistant to stripe rust, moderately resistant to Septoria tritici leaf blotch and BYD, and moderately susceptible to leaf rust. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1255 in the UC Regional Cereal Testing program from 2000-2006 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California.

PRISTINE
Pristine is a hard white spring wheat. It was released by Western Plant Breeders. It was selected from the cross Golden 86/Fergus. It is medium-early maturing. It was evaluated as Entry 1280 in the UC Regional Cereal Testing program from 2000-2002 for spring planting in the intermountain region of northern California

RAMONA 50
Ramona 50 is a hard white spring wheat. It was released by the California AES and USDA-ARS in 1951. It was selected from the cross Martin/3*Hard Federation//6*Ramona/3/2*Ramona 44. Its experimental designation was C620009. It was very popular in California for 15 years after its release. It has very early maturity and is short statured. Spikes are awnless with bronze glumes. Seed is large and generally hard. At the time of release it was resistant to bunt, moderately resistant to stem rust, and susceptible to Septoria tritici leaf blotch. It was evaluated as Entry 1 in the UC Regional Cereal Testing program from 1994-1995 for late fall planting in the Central Valley and surrounding areas of California for forage. *Crop Science 4:447 (1964)*

SIETE CERROS 66
Siete Cerros 66 is a hard white spring wheat. It was developed by the International Maize and Wheat Improvement Center (CIMMYT) in cooperation with the Mexican Ministry of Agriculture (INIA) and released in 1966. It was selected from the cross Pénjamo'S'/Gabo 55. Its experimental designation was C660015. It is a semi-dwarf with intermediate maturity. Spikes are brown, fully awned, erect and mid-dense to dense. Kernels are semi-hard and medium sized. It has tenacious gluten, thus is poor for bread-making. At the time of evaluation, Siete Cerros 66 was resistant to stem rust and powdery mildew, resistant to moderately susceptible to leaf rust, and susceptible to stripe rust, Septoria tritici leaf blotch, bunt and BYD. It was evaluated as Entry 4 in the UC Regional Cereal Testing program from 1980-1984 for late fall planting in the Central Valley, surrounding areas, the south-central coast region, and southern desert areas of California. *Crop Science 12:131 (1972)*

VAIOLET
Vaiolet is a hard white spring wheat. It was developed by AllStar Seed Company and released in 1998. It was selected from the cross Manital/Linea 119. It is awnless and has no vernalization requirement. It has good breadmaking potential and tolerance to fungal diseases with the exception of Septoria tritici leaf blotch. It is a medium late maturing semidwarf with good straw strength. At the time of evaluation it was moderately resistant to stripe rust and moderately susceptible to BYD. It was evaluated in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program in 2007 for spring planting in the intermountain region of northern California and as Entry 1587 in the UC Regional Cereal Testing program in 2008 for late fall planting in the Central Valley and southern desert areas of California.

WINSOME
Winsome is a hard white spring wheat. It was released by the Oregon AES in 1998. It was selected from the cross Hork "s"/Yamhill//Kalyansona/Bluebird. Its experimental designations were Pfau 'S' and OR4870453. It is late maturing with an average heading date 4 days later than ID377S. It has stiff straw. It is superior for Asian noodle production and has milling properties between those of Klasic and ID377S. At the time of release it was moderately resistant to stripe rust (though susceptible to the race complex in the Washington's Skagit Valley), leaf rust, and BYD. It was evaluated as Entry 1196 in the UC Regional Cereal Testing program from 1998-2004 for spring planting in the intermountain region of northern California.

CULTIVAR ARCHIVES (Cultivars previously evaluated by UC Small Grains Program)
DURUM WHEAT

ALDENTE
Aldente is a durum wheat. It was developed by Western Plant Breeders. It was selected from the cross WB Turbo/WB 881 Blend. It is medium maturing with fair straw strength. At the time of evaluation it was resistant to Septoria tritici leaf blotch. It was evaluated as Entry 918 in the UC Regional Cereal Testing program from 1991-1993 for late fall planting in the Central Valley and the Imperial Valley of California.

ALDURA
Aldura is a durum wheat. It was released by Northrup-King & Co. in 1978. It was selected from the cross Albatross/Leeds. Its experimental designation was NK76D-1107. Aldura is short-statured (about 7 cm shorter than Produra), with good lodging resistance. It is medium-late in maturity. Juvenile growth habit is erect. Waxy bloom is present on the stem and flag sheath. Leaf blades and sheath are not hairy. The auricles are not hairy and have no anthocyanin. The stem is hollow. The flag leaf is erect at booting and not twisted. The spike is awned, oblong, and dense. Glumes are light brown or tan, glabrous, long and wide. Shoulders are wanting. Beaks are acuminate. The keel is strong. Awns are white. The last rachis internode is smooth. Three tufts of hair originate at the rachis nodes. Kernels are amber, vitreous, long and elliptical. Kernel size is about 8 mm long and 3 mm wide. The germ is small and cheeks are rounded with a mid-deep narrow crease. The brush is short and not collared. The semolina color is almost equal to that of North Dakota durum and cooking quality is good. At the time of release Aldura was resistant to moderately resistant to Septoria tritici leaf blotch, BYD, stripe rust, leaf rust, and powdery mildew. It was evaluated as Entry 410 in the UC Regional Cereal Testing program from 1980-1993 for late fall planting in the Central Valley and the Imperial Valley of California.

ALTAR 84
Altar 84 is a durum wheat. It was released in Mexico by the National Institute of Forestry, Agriculture and Animal Science Research (INIFAP) in 1984. It was selected from the cross Ruff"S"/Fg"S"//Mexi75 /Shearwater"S" made in 1976 by CIMMYT. Its experimental designation was CD22344-A-8M-1Y-1M-1Y. Altar 84 was known as the breeding line Gallareta "S" prior to its release. Altar 84 has medium-early maturity, with short straw and good lodging resistance. It has higher test weight and lower 1000-grain weight than Mexicali 75 and Yavaros 79. Yellowberry percentage is normally low. The spike is awned, oblong to fusiform, and somewhat inclined at maturity. Glumes are white, long, and wide. Shoulders are oblique, and the beak is acuminate. Awns are black, 13-15 cm long. Kernels are amber, long, and ovate. The crease is shallow, medium width. The cheeks are rounded. The brush is short and the collar is lacking. It has good spaghetti cooking characteristics. At the time of evaluation it was resistant to Septoria tritici leaf blotch. It was evaluated as Entry 714 in the UC Regional Cereal Testing program from 1986-1992 and in 2005 for late fall planting in the Central Valley and the Imperial Valley of California.

ARUBA
Aruba is a durum wheat. It was released by Western Plant Breeders in 1994. It was selected from a male-sterile facilitated recurrent selection population (SDP-84 CHA). Its experimental designations were PH 888-169 and WPB 8001. It has late maturity and good straw strength. At the time of release it was resistant to Septoria tritici leaf blotch. It was evaluated as Entry 911 in the UC Regional Cereal Testing program from 1991-1993 and in 1995 for late fall planting in the Central Valley and the Imperial Valley of California.

BITTERN
Bittern is a durum wheat. It was developed by CIMMYT in Mexico and received in California for evaluation in 1980. It was from the cross JO'S'-AA'S'*FQ'S'. Its experimental designation was D7911. It is medium late maturing with poor straw strength. During the period of evaluation it was resistant Septoria tritici leaf blotch and moderately susceptible to BYD. It was evaluated as Entry 481 in the UC Regional Cereal Testing program from 1980-1983 for late fall planting in the Central Valley and the Imperial Valley of California.

BRAVADUR
Bravadur is a durum wheat. It was developed by Farmers Marketing Corporation (now World Wide Wheat). It was selected from a male-sterile facilitated recurrent selection population (MSFRS Quality Pop). Its experimental designation was FMC D5171-1. It is medium early maturing with poor straw strength. At the time of evaluation it was resistant to leaf rust, moderately resistant to powdery mildew, and moderately susceptible to stripe rust and BYD. It was evaluated as Entry 819 in the UC Regional Cereal Testing program in 1989-1991 and from 2003-2005 for

late fall planting in the Central Valley and the Imperial Valley of California.

CANDURA
Candura is a durum wheat. It was released by World Wide Wheat in 2003. It was selected from a male-sterile facilitated recurrent selection population (MSFRS Desert Durum Quality Population). Its experimental designation was WWW D3121. It is medium maturing with fair straw strength. At the time of release it was resistant to leaf rust, moderately susceptible to BYD, and susceptible to stripe rust. It was evaluated as Entry 1253 in the UC Regional Cereal Testing program from 2000-2005 for late fall planting in the Central Valley and the Imperial Valley of California.

CORTEZ
Cortez is a durum wheat. It was released by Western Plant Breeders in 1994. It was selected from a male-sterile facilitated recurrent selection population (Turbo Alpha POP-86 CHA). Its experimental designations were PH 888-103-3 and WPB 8005. It is a medium height semi-dwarf with excellent lodging resistance. It is relatively late maturing (similar to WestBred Turbo). It has dark awns. It is tolerant to black point. It has good gluten strength, and very good HVAC and semolina color. At the time of release it was resistant to stripe rust, leaf rust, Septoria tritici leaf blotch, and BYD, and moderately resistant to powdery mildew. It was evaluated as Entry 944 in the UC Regional Cereal Testing program from 1992-2001 and in 2005 for late fall planting in the Central Valley and the Imperial Valley of California.

DELUXE
Deluxe is a durum wheat. It was developed by Farmers Marketing Corporation (now World Wide Wheat) and released by World Wide Wheat in 1998. It was selected from a male-sterile facilitated recurrent selection population (MSFRS Durum Qual Pop). Its experimental designation was FMC 1856. It is awned and has medium-late maturity and fair straw strength. At the time of release it was resistant to Septoria tritici leaf blotch and leaf rust, moderately resistant to powdery mildew, and moderately susceptible to stripe rust and BYD. It was evaluated as Entry 1103 in the UC Regional Cereal Testing program in 1996 and from 1998-2003 for late fall planting in the Central Valley and the Imperial Valley of California.

DESERT TITAN
Desert Titan is a durum wheat. It was received for testing from Imperial Valley Milling. It has late maturity and good straw strength. At the time of evaluation it was resistant to leaf rust and powdery mildew, and moderately resistant to stripe rust and BYD. It was evaluated as Entry 1047 in the UC Regional Cereal Testing program in 1994 for late fall planting in the Central Valley and the Imperial Valley of California.

DUREX
Durex is a durum wheat. It was released by Farmers Marketing Corporation (now World Wide Wheat) in 1989. It was selected from a male-sterile facilitated recurrent selection population (AZ 85 MSFRS Durum Population). Its experimental designation was FMC D5238. It matures about 2 days later than Mexicali, is 1-2 inches shorter and moderately resistant to lodging (better than Mexicali). Durex has good grain quality and high grain protein content. At the time of release it was resistant to stripe rust and leaf rust, moderately resistant and to powdery mildew, and moderately susceptible to Septoria tritici leaf blotch and BYD. It was evaluated as Entry 809 in the UC Regional Cereal Testing program from 1988-1997 for late fall planting in the Central Valley and the Imperial Valley of California.

DURFORT
Durfort is a durum wheat. It was released by Farmers Marketing Corporation (now World Wide Wheat) in 1995. It was selected from a male-sterile facilitated recurrent selection population (MSFRS Quality Population). Its experimental designation was FMC 5317B. It has medium late maturity and fair to good straw strength. At the time of evaluation it was resistant to stripe rust, leaf rust and Septoria tritici leaf blotch, and moderately resistant to powdery mildew and BYD. It was evaluated as Entry 1044 in the UC Regional Cereal Testing program from 1994-1995 and in 1997 for late fall planting in the Central Valley and the Imperial Valley of California.

EDDIE

Eddie is a durum wheat. It was released by Farmers Marketing Corporation (now World Wide Wheat) in 1995. It was selected from a male-sterile facilitated recurrent selection population (MSFRS Quality Durum Pop). Its experimental designations were CONT D8899 and FMC 8869. It is medium late maturing with fair straw strength. At the time of release it was resistant to leaf rust, moderately resistant to stripe rust, powdery mildew, and BYD, and susceptible to Septoria tritici leaf blotch. It was evaluated as Entry 915 in the UC Regional Cereal Testing program from 1991-1999 for late fall planting in the Central Valley and the Imperial Valley of California.

GERMAINS 5003D
Germains 5003D is a durum wheat. It was developed by Germains Seed Company. It is medium late maturing with good straw strength. At the time of evaluation it was resistant to stripe rust, leaf rust, and Septoria tritici leaf blotch. It was evaluated as Entry 438 in the UC Regional Cereal Testing program from 1980-1981 late fall planting in the Central Valley and the Imperial Valley of California.

IMPERIAL
Imperial is a durum wheat. It was released by Western Plant Breeders in 1987. It was selected from a male-sterile facilitated recurrent selection population (Southern Durum Pop80). Its experimental designation was PH883-15. It has late maturity and fair straw strength. At the time of evaluation it was resistant to Septoria tritici leaf blotch, stripe rust, leaf rust and powdery mildew, and moderately susceptible to BYD. It was evaluated as Entry 676 in the UC Regional Cereal Testing program from 1985-1990 late fall planting in the Central Valley and the Imperial Valley of California.

KOFA
Kofa is a durum wheat. It was released by Western Plant Breeders in 1994. It was selected from a male-sterile facilitated recurrent selection population (Dicoccum Alpha POP-85 S-1). Its experimental designations were PH 888-260 and WPB 8008. It is an awned, medium height semi-dwarf with fair straw strength. It is medium maturing (similar in heading to Westbred 881). It has excellent quality (high grain protein and excellent HVAC, gluten strength, and semolina color). At the time of release it was resistant to leaf rust and powdery mildew, and susceptible to Septoria tritici leaf blotch, stripe rust, and BYD. It was evaluated as Entry 947 in the UC Regional Cereal Testing program from 1992-2004 late fall planting in the Central Valley and the Imperial Valley of California.

LEVANTE
Levante is a durum wheat. It was developed by AllStar Seed Company and released in 2002. It was selected from the cross G80/Piceno/Ionio. It has good lodging resistance, good cold tolerance, high test weight, high grain protein content, very good gluten quality, and very good pasta-making quality. It has medium maturity and medium short height, averaging 39 inches. Awns are white. At the time of release it was resistant to stripe rust, leaf rust, and BYD, and moderately resistant to powdery mildew. It was evaluated as Entry 1588 in the UC Regional Cereal Testing program from 2007-2008 for late fall planting in the Central Valley and the Imperial Valley of California.

MATT
Matt is a durum wheat. It was released by Arizona Plant Breeders in 2000. It was selected from a male-sterile facilitated recurrent selection population (MSFRS - A&C 94). Its experimental designation was APB D95-434. It is awned, has medium maturity, and poor straw strength. At the time of release it was resistant to stripe rust and leaf rust, moderately resistant to BYD, and susceptible to Septoria tritici leaf blotch. It was evaluated as Entry 1179 in the UC Regional Cereal Testing program from 1998-2004 for late fall planting in the Central Valley and the Imperial Valley of California.

MEAD
Mead is a durum wheat. It was released by WestBred LLC in 2006. It was selected from the cross PH 888-118-5/Westbred 881. It is medium late maturing. Its experimental designation was YU895-89Cd. It is a reselection of Orita for low cadmium content. It was evaluated as Entry 1513 in the UC Regional Cereal Testing program in 2006 for late fall planting in the Imperial Valley of California.

MEXICALI 75
Mexicali 75 is a durum wheat. It was released by the Mexican Agriculture Research Institute (INIA) in 1975. It originated from the cross Gdovz 469/Jo “S”*61.130-Lds from the International Maize and Wheat Improvement

Center (CIMMYT) in Mexico. Its experimental designation was D750001. Mexicali 75 is short-statured with poor lodging resistance and medium-early maturity. The spike is awned, oblong to fusiform, dense and inclined at maturity. Glumes are white, long and wide. Shoulders are elevated with acuminate beaks. Awns are white, 6-8 cm long. Kernels are amber, hard, long, and elliptical. The crease is mid-wide and shallow. Cheeks are rounded. The brush is short and lacks a collar. At the time of release it was moderately susceptible to BYD and Septoria tritici blotch and moderately resistant to stripe rust, leaf rust and powdery mildew. It was evaluated as Entry 169 in the UC Regional Cereal Testing program from 1980-1997 for late fall planting in the Central Valley and the Imperial Valley of California.

MINOS

Minos is a durum wheat. It was released by Arizona Plant Breeders in 1993. It was selected from a male-sterile facilitated recurrent selection population (APB MSFRS Pop). Its experimental designation was APB D03-5. It is awned, has medium maturity, and poor straw strength. At the time of release it was resistant to leaf rust and powdery mildew, moderately resistant to stripe rust, moderately susceptible to Septoria tritici leaf blotch, and susceptible to BYD. It was evaluated as Entry 952 in the UC Regional Cereal Testing program from 1992-1997 for late fall planting in the Central Valley and the Imperial Valley of California.

MODOC

Modoc is a durum wheat. It was released by the California AES in 1975. It was selected from the cross D7069/Leeds made at UC Davis in 1969. D7069 was developed by the International Maize and Wheat Improvement Center (CIMMYT) from the cross Tremez Molle/*2Tehuacan//*2Zenati Bouteille/Wells. Its experimental designation was TLD701W. Modoc is short-statured with good lodging resistance and medium-early maturity. The spike is long-awned, oblong to fusiform, mid-dense and erect. The awns are about twice as long as the spike. The spike has white glumes. Spikelets are moderately to densely arranged and the peduncle is S-shaped. Glumes are glabrous, narrow to mid-wide, mid-long with narrow, apiculate shoulders and short beaks. Kernels are amber, hard, mid-long, elliptical and essentially brushless. The germ is large with a mid-wide crease that is mid-deep to shallow. Cheeks are rounded. Modoc has acceptable milling and semolina qualities. At the time of release it was resistant to leaf rust, moderately resistant to Septoria tritici blotch, and susceptible to stripe rust, BYD, and powdery mildew. It was evaluated as Entry 254 in the UC Regional Cereal Testing program from 1980-1989 for spring planting in the intermountain region of northern California (Tulelake basin) and for late fall planting in the Central Valley and the Imperial Valley of California. *Crop Science 18:916 (1978)*

MOHAWK

Mohawk is a durum wheat. It was released by Western Plant Breeders (WestBred LLC) in 1998. It was selected from a male-sterile facilitated recurrent selection population (883-22 Alpha-85 CHA). Its experimental designations were PH 888-219 and WPB 8010. It is a dark awned, medium height semi-dwarf (averages 38 inches in plant height, the same as Crown and 1 inch taller than Desert King and Kronos) with poor straw strength. It is medium early maturing. It has very good quality (very good HVAC and gluten strength, and excellent semolina color). At the time of release it was resistant to leaf rust, moderately resistant to stripe rust, moderately susceptible to powdery mildew and BYD, and susceptible to Septoria tritici leaf blotch. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1024 in the UC Regional Cereal Testing program from 1994-2007 for late fall planting in the Central Valley and the Imperial Valley of California.

NUDURA

Nudura is a durum wheat. It was released by Northrup-King & Co. Its experimental designation was NK 85D9614. It is medium maturing and has good straw strength. At the time of evaluation it was resistant to Septoria tritici leaf blotch, BYD, leaf rust and powdery mildew, and moderately susceptible to stripe rust. It was evaluated as Entry 795 in the UC Regional Cereal Testing program from 1988-1993 for late fall planting in the Central Valley and the Imperial Valley of California.

OCOTILLO

Ocotillo is a durum wheat. It was released by Arizona Plant Breeders in 1993. It derives from a variant selected from Westbred 881. Its experimental designation was APB D#8. It is medium maturing and has good straw strength. At the time of release it was resistant to leaf rust, moderately susceptible to Septoria tritici leaf blotch, powdery mildew and BYD, and susceptible to stripe rust. It was evaluated as Entry 954 in the UC Regional Cereal Testing program

from 1992-1998 and from 2000-2001 for late fall planting in the Central Valley and the Imperial Valley of California.

PRODURA
Produra is a durum wheat. It was released by Northrup-King & Co. in 1975. It was selected the cross Tremez Molle Dwarf/*2 Tehuacan/2/Zenati/Bouteille//Wells/4/2* Barrigon Yaqui Dwarf/Tehuacan//Tacur Tipo 125 Dwarf/2* Tehuacan made in Mexico at CIMMYT. Its experimental designations were Pelicano, D790003 and NK 5012. It is a semi-dwarf, slightly shorter than Siete Cerros, with midseason maturity (matures about 4 days earlier than Siete Cerros). It has strong stems and resists lodging better than Siete Cerros. The spike is fully awned, fusiform, mid-dense and inclined. Glumes are pubescent, light tan, long and wide. Shoulders are wanting. Beaks are acuminate, awns are long, black and rough and tend to bleach from the apical end at maturity. At the time of release it was resistant to leaf rust, stem rust, and powdery mildew, and susceptible to BYD and cereal aphids. It was evaluated as Entry 162 in the UC Regional Cereal Testing program from 1981-1982 for late fall planting in the Central Valley and the Imperial Valley of California.

REVA
Reva is a durum wheat. It was released by Farmers Marketing Corporation (now World Wide Wheat) in 1992. It was selected from a male-sterile facilitated recurrent selection population (AZ 85 MSFRS Durum Population). Its experimental designation was FMC D5317. Reva is medium maturing (heads about 3 days later than Mexicali), and is 2-4 inches shorter, has fair straw strength (moderately resistant to lodging, better than Mexicali). At the time of release it was resistant to stripe rust and leaf rust, moderately resistant to powdery mildew, and moderately susceptible to Septoria tritici leaf blotch and BYD. It was evaluated as Entry 798 in the UC Regional Cereal Testing program from 1988-1994, in 1996, and from 1998-1999 for late fall planting in the Central Valley and the Imperial Valley of California.

RIA
Ria is a durum wheat. It was developed by Farmers Marketing Corporation (now World Wide Wheat) and released in 1995. It was selected from a male-sterile facilitated recurrent selection population (WWW MSFRS Quality Pop). Its experimental designations were FMC 5318B and D5318B. Ria is medium late maturing, and has fair straw strength. At the time of release it was resistant to stripe rust, leaf rust, and Septoria tritici leaf blotch, moderately resistant to powdery mildew, and moderately susceptible to BYD. It was evaluated as Entry 983 in the UC Regional Cereal Testing program from 1993-2006 for late fall planting in the Central Valley and the Imperial Valley of California.

SEPTRE
Septre is a durum wheat. It was received for testing from Imperial Valley Milling. It is late maturing and has poor straw strength. It was evaluated as Entry 854 in the UC Regional Cereal Testing program in 1989 for late fall planting in the Imperial Valley of California.

SKY
Sky is a durum wheat. It was released by Arizona Plant Breeders in 2000. It was selected from a male-sterile facilitated recurrent selection population (MSFRS for Quality). Its experimental designation was APB D95-412. It is awned, has medium early maturity and poor straw strength. At the time of release it was moderately resistant to stripe rust and powdery mildew, and moderately susceptible to Septoria tritici leaf blotch. It was evaluated as Entry 1178 (in 1998) and as Entry 1266 (from 2000-2001) in the UC Regional Cereal Testing program for late fall planting in the Central Valley and the Imperial Valley of California.

TACNA
Tacna is a durum wheat. It was released by Western Plant Breeders (WestBred LLC) in 1998. It was selected from a male-sterile facilitated recurrent selection population (Durum S-1/E. Wheat-89 S-1). Its experimental designations were PH 891-74 and WPB 8013. It is a medium height semi-dwarf with fair lodging resistance. It is medium early maturing (4 days earlier than WestBred 881). It has white awns. It has excellent quality (excellent HVAC and gluten strength, and very good to excellent semolina color). At the time of release it was resistant to leaf rust, moderately resistant to stripe rust and powdery mildew, and susceptible to Septoria tritici leaf blotch, BYD, and black point. It was evaluated as Entry 1057 in the UC Regional Cereal Testing program from 1995-2002 for late fall planting in the Central Valley and the Imperial Valley of California.

TITAN
Titan is a durum wheat. It was received for testing from Imperial Valley Milling in 1989. It is late maturing and has good straw strength. It was evaluated as Entry 855 in the UC Regional Cereal Testing program in 1989 for late fall planting in the Imperial Valley of California.

TRUMP
Trump is a durum wheat. It was released by World Wide Wheat in 2000. It was selected from a male-sterile facilitated recurrent selection population (WWW MSFRS Durum Quality Population). Its experimental designation was WWW D2656. It is late maturing with fair straw strength. At the time of release it was resistant to Septoria tritici leaf blotch, leaf rust, and stripe rust, moderately resistant to powdery mildew, and moderately susceptible to BYD. It was evaluated as Entry 1214 in the UC Regional Cereal Testing program from 1999-2000 for late fall planting in the Central Valley and the Imperial Valley of California.

WARD
Ward is a durum wheat. It was developed cooperatively by the North Dakota AES and USDA-ARS and released in 1972. It was selected from the cross Langdon/3/Ld 357//CI 7780/Ld 362/4/Br 180/Wells. Its experimental designations were D6674 and D730024. It has short, strong, white culms that may show purplish coloration under some conditions. It is about 2 cm shorter than Leeds with poor straw strength. It is late maturing (about 3 days later in heading than Rolette). The spike is awned (dehiscent at maturity), oblong, dense, and erect. The glumes are glabrous, yellow, mid-long to long, and mid-wide. The glume shoulders are narrow and elevated. The beaks are wide, acuminate, and 3-4 mm long. The awns are yellow and 6-16 cm long. The kernels are amber, hard, mid-long, and elliptical. The germ is midsized. The crease is mid-wide and shallow. The cheeks are angular to rounded. The brush is very short (essentially none). Milling and processing characteristics are excellent: Spaghetti color, cooking properties, and cooked spaghetti firmness are equal to Leeds. At the time of evaluation in California it was resistant to stripe rust, leaf rust, Septoria tritici leaf blotch, powdery mildew, and BYD. It was evaluated as Entry 572 in the UC Regional Cereal Testing program from 1982-1983 for late fall planting in the Central Valley and the Imperial Valley and for spring planting in the intermountain region of northern California. *Crop Science 14:607-608 (1974)*

WESTBRED 803
Westbred 803 is a durum wheat. It was released Western Plant Breeders. It was evaluated as Entry 531 in the UC Regional Cereal Testing program from 1981-1984 for spring planting in the intermountain region of northern California.

WESTBRED 881
Westbred 881 is a durum wheat. It was released by Western Plant Breeders in 1982. It was selected from the F2 bulk of a composite cross made up of four high-quality northern durum wheat cultivars (Ward, Wells, Cando and Wascana) crossed with two high yielding southern durum wheat cultivars (Mexicali 75 and Westbred 1000D). Its experimental designation was WDE8-4-6E. Westbred 881 is a medium height semi-dwarf with good lodging resistance and medium-early maturity. The spike is dense, fusiform, fully awned (awns are white), and erect. Glumes are white, glabrous, long, and wide. Shoulders are square and narrow. Beaks are wide, acuminate, and 2-3 mm long. The kernels are long, hard, amber, and elliptical. Germs are large. The brush is mid-sized, short, and not collared. The cheeks are rounded with a shallow, narrow crease. It has exceptionally good pasta producing qualities. It has excellent HVAC, very good to excellent gluten strength, and very good semolina color. At the time of evaluation it was resistant to leaf rust and powdery mildew and susceptible to stripe rust, Septoria tritici leaf blotch, black point and BYD. It was evaluated as Entry 522 in the UC Regional Cereal Testing program from 1981-2001 for late fall planting in the Central Valley and the Imperial Valley of California.

WESTBRED 883
Westbred 883 is a durum wheat. It was released by Western Plant Breeders. It was selected from a male-sterile facilitated recurrent selection population (S Durum Pop80). Its experimental designation was PH 883-2. It is early maturing and has poor straw strength. At the time of release it was resistant to stripe rust, leaf rust and powdery mildew, and susceptible to Septoria tritici leaf blotch and BYD. It was evaluated as Entry 675 in the UC Regional Cereal Testing program from 1985-1989 for late fall planting in the Central Valley and the Imperial Valley and for spring planting in the intermountain region of northern California.

WESTBRED 1000D
Westbred 1000D is a durum wheat. It was released by Western Plant Breeders in 1978. It was a selection from CI 15110 or Georgio 385. It has relatively late maturity with short, strong, light colored straw, and fair straw strength. Awns are rough, 5-12 cm long, and dark black at maturity. Glumes are long, wide, with square shoulders and acute beaks. Kernels are hard and amber in color. It was evaluated as Entry 519 in the UC Regional Cereal Testing program from 1980-1982 for late fall planting in the Central Valley and the Imperial Valley of California.

WESTBRED LAKER
Westbred Laker is a spring durum wheat. It was released Western Plant Breeders. It originated as a F3 selection from a 3-way composite cross population. Its experimental designation was C881-4. It is late maturing and has fair straw strength. It was evaluated as Entry 692 in the UC Regional Cereal Testing program from 1985-1989 for spring planting in the intermountain region of northern California.

WESTBRED TURBO
Westbred Turbo is a durum wheat. It was released by Western Plant Breeders in 1986. It was developed from a three-way composite cross made in 1978 and 1979 involving CIMMYT and Italian durum lines. The composite (Gluten Durum Pop79) was developed to combine good semolina color with high gluten in a semi-dwarf durum type. Its experimental designation was PH882-21. Westbred Turbo is a semi-dwarf with fair lodging resistance and late maturity. It is two inches taller than Yavaros 79 and 1-8 days later to flower depending on the date of planting. Spikes are oblong to fusiform and lax. Glumes are white, long, and wide with oblique shoulders and acuminate beaks. Awns are black and 11-13 cm long. Kernels are amber, hard, long, and ovate with a shallow crease of medium width. Cheeks are rounded. Brushes are short and collars are lacking. It is satisfactory for domestic and export pasta production if grown under high fertility levels. At the time of release it was resistant to moderately resistant to BYD, Septoria tritici leaf blotch, stripe rust, leaf rust, and powdery mildew. It subsequently became moderately susceptible to powdery mildew. It was evaluated as Entry 674 in the UC Regional Cereal Testing program from 1985-1999 for late fall planting in the Central Valley and the Imperial Valley and for spring planting in the intermountain region of northern California.

YAVAROS 79
Yavaros 79 is a durum wheat. It was released by the National Agricultural Research Institute (INIA) in Mexico in 1979. It was selected from the cross Jo ‘S’ – AA ‘S’ * FG ‘S’, or Bittern ‘S’, from the CIMMYT program. Its experimental designation was D8054. Yavaros 79 is short-statured with poor lodging resistance and medium late maturity. Spikes are awned, oblong to fusiform, mid-dense and inclined at maturity. Glumes are white, long and wide. Shoulders are elevated. The beak is acuminate. Awns are black, 7-11 cm long. Kernels are amber, hard, and elliptical. The crease is shallow and narrow. Cheeks are rounded. The brush is short and collars are lacking. At the time of release it was resistant to Septoria tritici leaf blotch, stripe rust, leaf rust and powdery mildew, and moderately susceptible to BYD. It was evaluated as Entry 496 in the UC Regional Cereal Testing program from 1981-1998 for late fall planting in the Central Valley and the Imperial Valley of California.

CULTIVAR ARCHIVES (Cultivars previously evaluated by UC Small Grains Program)
SOFT WHITE SPRING WHEAT

BLANCA
Blanca is a soft white spring wheat. It was developed cooperatively by the USDA-ARS and the Idaho AES and released by the USDA-ARS and the Colorado AES in 1986. It was selected from the cross IDO045/5/2*A6514S-A-102-1/4/2A6535S-443-101/3/SFL//PI227196/A63166S-A-2 -8; IDO045 = Yaktana 54A*4//Norin 10/Brevor/3/2*Yaqui 50/4/Norin 10/Brevor//Baart/Onas; A6514S-A-102-1 = Yaktana 54A*4/Norin 10/Brevor/5/ Norin 10/Brevor//3*Lemhi 53/3/ Lemhi 62/4/5*Lemhi 53//7*Lee/Transfer; A6535S-443-101 = Fielder sib and Fieldwin sib; A63166S-A-2-8 = Twin sib. Its experimental designation was IDO174. Blanca has a spring growth habit and is an awned, white-glumed cultivar most similar in appearance to Owens. It is a semi-dwarf with plant height similar to Penawawa and Fieldwin and intermediate maturity. It has excellent pastry and cookie-making

quality and satisfactory flour extraction percentage. At the time of release it was susceptible to stripe rust and leaf rust, and moderately susceptible to BYD and Septoria tritici leaf blotch. It was evaluated as Entry 580 in the UC Regional Cereal Testing program from 1982-1998 for spring planting in the intermountain region of northern California. *Crop Science 28:577 (1988)*

BLISS
Bliss is a soft white spring wheat. It was developed cooperatively by the Idaho AES and USDA-ARS and released jointly by the Idaho and Oregon AESs and USDA-ARS in 1984. It was selected from the cross Hyslop/Fielder. Its experimental designation was IDO172. It is a semi-dwarf with erect to inclined, oblong, mid-dense, awned spikes. It matures 3-5 days later than Owens and is 5 cm taller than Dirkwin and Owens. It has stiff straw but is susceptible to lodging. Glumes are long and mid-wide with narrow, oblique shoulders. Beaks are narrow, acuminate, and 3-5 mm long. The kernels are soft, white, mid-long, and ovate with rounded cheeks and a mid-deep crease. Pastry quality is satisfactory. At the time of release it was resistant to stripe rust, moderately resistant to black point, black chaff and powdery mildew, and moderately susceptible to leaf rust. It was evaluated as Entry 723 in the UC Regional Cereal Testing program from 1986-1989 for spring planting in the intermountain region of northern California. *Crop Science 26:1087 (1986)*

CALORWA
Calorwa is a soft white spring club wheat. It was developed at the University of California, Davis, cooperatively with the Washington State Agricultural Research Center, USDA-ARS, and the Oregon AES and released by Washington, Oregon, Idaho and California AESs and USDA-ARS in 1994. It was selected from the cross Aus221/Inia//2*Shasta/3/Tincurrin/Anza. Its experimental designation was WUC657. It is meant for seeding into winter-killed winter club wheat acreage. Calorwa has erect, awned, typical “compactum” (club) spikes which are short, elliptical, dense, with white chaff, awns, and straw. It is a semi-dwarf with plant height slightly shorter than Penawawa, fair to poor straw strength, and early-medium maturity. It has satisfactory soft white club milling and baking properties. It is a pastry wheat with weak mixing properties, complementary to the soft white winter club wheat cultivars. At the time of release it was resistant to stripe rust, leaf rust, stem rust and powdery mildew. It was evaluated as Entry 1012 in the UC Regional Cereal Testing program from 1993-1996 for spring planting in the intermountain region of northern California.

CENTENNIAL
Centennial is a soft white spring wheat. It was developed jointly by the University of Idaho and USDA-ARS and released in cooperation with the Oregon AES and the Washington Agricultural Research Center in 1990. It was selected from the cross Cowbird 'S'/2*Sterling. Its experimental designations were ID 0312 and A803S-B-6. It is adapted to higher elevations under both irrigated and rainfed management in the Pacific Northwest. It is a semi-dwarf and similar in height to Penawawa with comparable lodging resistance. It has intermediate maturity and is several days earlier than Penawawa. Centennial has pubescent, purple auricles, semi-erect, short flag leaves and dark green color at heading. It has short, ovate, awned spikes. At the time of release it was resistant to stripe rust, moderately susceptible to black chaff and BYD, and susceptible to leaf rust and stem rust. It is susceptible to Hessian fly. It was evaluated as Entry 858 in the UC Regional Cereal Testing program in 1989 and from 1993-2003 for spring planting in the intermountain region of northern California. *Crop Science 31:1095-1096 (1991)*

CHALLIS
Challis is a soft white spring wheat. It was released by Western Plant Breeders in 2000. It was selected from the cross Penawawa/Edwall. Its experimental designation was BZ 692-108. It was selected to replace Vanna. It is an awned semi-dwarf with white chaff. It has medium maturity (2-3 days earlier than Vanna), is similar to Penawawa in plant height, and has excellent straw strength. It has very good milling and baking characteristics. At the time of release it was moderately resistant to powdery mildew and root rot, moderately susceptible to stripe rust, leaf rust, and BYD, and susceptible to Hessian fly. It was evaluated as Entry 1195 in the UC Regional Cereal Testing program from 1998-2003 for spring planting in the intermountain region of northern California.

DIRKWIN
Dirkwin is a soft white spring wheat. It was released jointly by the Idaho and Oregon AESs and USDA-ARS in 1978. It was selected from the cross Twin/Triple Dirk. Its experimental designation was IDO106. It is a semi-dwarf, medium maturing wheat with straw strength and height similar to Twin. Spikes are awnless, fusiform to oblong, mid-

dense, and erect to inclined at maturity. Glumes are glabrous, white, long and wide with mid-wide oblique shoulders. Beaks are mid-wide and obtuse. The kernels are soft, white, short to mid-long, and ovate with a narrow to mid-wide, shallow crease. The kernels have rounded cheeks and a midsized, mid-long brush. Pastry quality is satisfactory and similar to that of Twin. At the time of release it was resistant to stripe rust and leaf rust and moderately resistant to powdery mildew. It subsequently became highly susceptible to stripe rust, leaf rust, and Septoria tritici leaf blotch. It also is susceptible to stem rust, black chaff and Hessian fly. It was evaluated as Entry 474 in the UC Regional Cereal Testing program from 1980-1984, from 1989-2006, and in 2011 for spring planting in the intermountain region of northern California and for fall-sowing (as a forage wheat) in the Sacramento and northern San Joaquin Valleys and south
central coast regions of California. *Crop Science 20: 826 (1980)*

EDEN
Eden is a soft white spring club wheat. It was developed by the Agricultural Research Center of Washington State University in cooperation with the Idaho and Oregon AESs and the USDA-ARS, and jointly released by the AESs of Washington, Idaho, and Oregon and the USDA-ARS in 2003. It was selected from the cross Wawawai/Calorwa. Its experimental designations were WA007902, K92622 and S9700431. Eden was released as a replacement for the spring club cultivar Calorwa in the intermediate to high rainfall (>400 mm of average annual precipitation), non-irrigated wheat production regions of Washington State based on its high grain yield potential and superior end-use quality. Eden is an intermediate height, semi-dwarf wheat. The average plant height is 75 cm, 11 cm and 4 cm shorter than Wawawai and Zak, respectively, and 8 cm taller than Calorwa. It has good straw strength. Eden heads at the same time as Wawawai, 3 days later than Calorwa, and 2 days earlier than Zak. It has compact, elliptical heads with white awns and medium length, white glumed spikes. Eden has humped, ovate kernels that are white, soft and smooth. Seed has a pinched germ with a wide, slightly open crease, angular, offset cheeks, and a short, goatee brush. At the time of release it was resistant to stripe rust and susceptible to the Hessian fly and the Russian wheat aphid. It was evaluated as Entry 1382 in the UC Regional Cereal Testing program from 2002-2006 for spring planting in the intermountain region of northern California. *Crop Science 44: 1870-1871 (2004)*

EDWALL
Edwall is a soft white spring wheat. It was developed cooperatively by the Washington Agricultural Research Center and the USDA-ARS and released in 1984. It was selected from the cross Potam 70/Fielder (Sel. 181). Its experimental designation was WA 6830. It is an awned, semi-dwarf with white chaff and medium-large white ovate kernels. It matures earlier than Urquie and at about the same time as Owens and Waverly. Aluminum tolerance is similar to Fielder. Straw strength is similar to Fielder (poor). It has satisfactory milling and pastry flour quality. At the time of release it was resistant to leaf rust and stem rust, susceptible to stripe rust (but with moderate to excellent adult plant resistance), common bunt, powdery mildew, and Hessian fly. It was evaluated as Entry 613 in the UC Regional Cereal Testing program in 1983, from 1985-1986, and from 1989-1991 for spring planting in the intermountain region of northern California.

FIELDER
Fielder is a soft white spring wheat. It was released jointly by the USDA-ARS and the Idaho, Oregon, and Washington AESs in 1974. It was selected from the cross Yaktana 54A*4//Norin 10/Brevor/3/2*Yaqui50/4/Norin 10/Brevor//Baart/Onas. Its experimental designation was ID0044. It is a semi-dwarf with stiff straw and medium maturity. It is awned with white glumes. It has milling and baking qualities similar to Twin. At the time of release it was resistant to stripe rust, stem rust, and leaf rust and moderately resistant to powdery mildew. It subsequently became susceptible to stripe rust. It was evaluated as Entry 249 in the UC Regional Cereal Testing program from 1980-1987 for spring planting in the intermountain region of northern California. *Crop Science 15:104 (1975)*

FIELDWIN
Fieldwin is a soft white spring wheat. It was released jointly by the Idaho, Oregon, and Colorado AESs and USDA-ARS in 1977. It was selected from the same cross as Fielder, Yaktana 54A*4//Norin 10/Brevor/3/2*Yaqui50/4/Norin 10/Brevor//Baart/Onas. Its experimental designation was IDO087. It is similar in appearance and averages 3 cm taller and 1 day later in maturity than Fielder. It is stiff-strawed with spikes that are erect to inclined, awned, fusiform to oblong and mid-dense. Glumes are white, mid-long and mid-wide. Shoulders are narrow and oblique to square. Beaks are narrow, acuminate and 2-6 mm long. Kernels are soft, white, ovate and mid-long. The crease is mid-wide and mid-deep. Cheeks are rounded. The brush is midsized and short to mid-long. Fieldwin has satisfactory

milling and pastry characteristics. At the time of release it was moderately resistant to stripe rust, leaf rust, stem rust and powdery mildew. It subsequently became susceptible to stripe rust and moderately susceptible to leaf rust, stem rust, and black chaff. It was evaluated as Entry 398 in the UC Regional Cereal Testing program from 1980-2002 for spring planting in the intermountain region of northern California. *Crop Science 18:916 (1978)*

JUBILEE

Jubilee is a soft white spring wheat. It was developed by the Idaho, Oregon, and Washington AESs and released in 2001. It was selected from the cross ID0184/ID0159//Tonichi 'S'/2*Sterling. Its experimental designation was ID 525. Jubilee is a semi-dwarf wheat, with excellent grain yield potential and end-use quality, that is adapted to rain-fed and irrigated production at elevations above 1000 m. Jubilee is most similar in appearance to Whitebird. Plant height averages 86 cm, equal to Vanna and 3 cm shorter than Whitebird. Jubilee is similar in heading date to Whitebird and Penawawa, heading approximately 2 days later than Centennial and 4 days earlier than Treasure. It has an unpigmented coleoptile and erect juvenile growth. It has a recurved, twisted flag leaf and an awned, erect, lax head, which is white-chaffed at maturity. Seed is soft, white, elliptical, and plump, with a kernel type similar to Centennial. The superior soft wheat quality of Jubilee appears to be due in part to reduced levels in the flour of damaged starch and pentosans. At the time of release it was resistant to stripe rust (adult plant resistance) and susceptible to Hessian fly. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1227 in the UC Regional Cereal Testing program from 1999-2003 for spring planting in the intermountain region of northern California. *Crop Science 43: 734 (2003)*

LOUISE

Louise is a soft white spring wheat. It was developed and jointly released by the Agricultural Research Center of Washington State University in cooperation with Idaho and Oregon AES and the USDA-ARS in 2005. It was selected from the cross Wakanz//Wawawai. Its experimental designation was WA007921. Louise was released as a replacement for the soft white spring variety Zak in the intermediate to high rainfall (>400 mm of average annual precipitation), non-irrigated wheat production regions of Washington based on its superior end-use quality, high grain yield potential, high-temperature adult-plant resistance to local races of stripe rust, and partial resistance to the Hessian fly. It is has mid-season maturity, common head type, and white straw. Heading date is the same as for Alpowa and averages 1 day earlier than Zak, 1 day later than Alturas, and 2 days later than Nick. It is an intermediate height semi-dwarf (average height is 42 inches). It has poor straw strength. It has lax, tapering, inclined curved heads with white awns and white glumes that are long in length, wide in width with medium, apiculate shoulders, and narrow beaks. Louise has elliptical kernels that are white, soft, and smooth. Seed has a midsized germ with a narrow, mid-depth crease, angular cheeks, and a medium, non-collared brush. It has high molecular weight glutenin subunits of null (1A), 7+9 (1B) and 5+10 (1D). Milling and baking qualities are equivalent or superior to Zak and are dramatic improvements over Alpowa. At the time of release it was moderately susceptible to stripe rust (but has high-temperature, adult-plant resistance), heterogeneous for resistance to Hessian fly biotypes E, F, and GP, and susceptible to the Russian wheat aphid. It was evaluated as Entry 1488 in the UC Regional Cereal Testing program from 2005-2006 and in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program in 2008 and in 2011 for spring planting in the intermountain region of northern California. *Crop Science 46:1384-1385 (2006)*

OWENS

Owens is a soft white spring wheat. It was developed cooperatively by the USDA-ARS and the Idaho AES and released in 1981. It was selected from the cross IDO045/6/2*A6514S-A-102-1/5/2*A6535S-443-1013/A63166S-A-4- 27-1-2//PI227196/A63166S-A-2-8/4/Gaines/Lemhi 53; A6514S-A-102-1 = Yaktana 54A*4//Norin 10/Brevor/3/ Twin; IDO045 and A6535S-443-101 are sister selections of Fielder and Fieldwin; A63166S-A-2-8 is a sister selection of Twin. Its experimental designation was IDO0185. Owens has a spring growth habit and is similar to Twin and Fieldwin in maturity. Straw strength is similar to Twin and Dirkwin and slightly weaker than Fieldwin. Spikes are erect to inclined, awned, oblong, and mid-dense. Glumes are white, mid-long, and mid-wide with mid-wide square to elevated shoulders. Beaks are narrow, acuminate, and 2-6 mm long. Kernels are soft, white, mid-long and ovate with a mid-sized germ, rounded cheeks, and a narrow mid-deep crease. Flour yield is slightly lower than for Fieldwin. Pastry quality is satisfactory. At the time of release it was resistant to stripe rust (though moderately susceptible to race CDL-17), moderately susceptible to leaf rust and powdery mildew, and susceptible to black point. It subsequently became susceptible to stripe rust. It was evaluated as Entry 578 in the UC Regional Cereal Testing program from 1982-1988 for spring planting in the intermountain region of northern California. *Crop Science 24: 210-211 (1984)*

PENAWAWA
Penawawa is a soft white spring wheat. It was developed cooperatively by the Washington Agricultural Research Center and USDA-ARS and jointly released by the Washington Agricultural Research Center, USDA-ARS, and Oregon AES in 1985. It was selected from the cross Potam 70/Fielder. Its experimental designation was WA6920. Penawawa has a spring growth habit. It is a semi-dwarf with intermediate height (about the same height as Edwall and Waverly), good lodging resistance and intermediate maturity (heads 1 day later than Edwall and Waverly). Spikes are erect, semi-lax, and oblong with medium long awns. Glumes are glabrous and mid-long and terminate in short (0.5 to 1.0 cm) awn-tipped beaks. The shoulders and glumes on basal spikelets are almost wanting, but widen on spikelets upward on the spike. Glumes on upper spikelets have elevated shoulders. Kernels are white, soft, mid-long, and ovate, with a large brush and medium-sized, round-ovate germ. Penawawa has satisfactory milling and pastry quality. At the time of release it was resistant to stripe rust (adult plant resistance) and stem rust, moderately susceptible to powdery mildew, and susceptible to common bunt, black chaff, and Hessian fly. It subsequently became susceptible to leaf rust, stem rust, and Septoria tritici leaf blotch. It was evaluated as Entry 693 in the UC Regional Cereal Testing program from 1985-1989 and from 1993-1998 for spring planting in the intermountain region of northern California and late-fall planting in the Sacramento and northern San Joaquin Valleys and south central coast regions of California.

POMERELLE
Pomerelle is a soft white spring wheat. It was released by the Idaho, Oregon, and Washington AESs and the USDA-ARS in 1996. It was selected from the cross A771084-B/ID0246. Its experimental designation was IDO448. Pomerelle is similar in appearance to Treasure. It is a semi-dwarf with intermediate height, good lodging resistance and intermediate-late maturity. It heads about 1 day earlier and is about 2 cm shorter than Treasure. It has a semiclavate, awned spike, with long and wide glumes that have oblique shoulders and acuminate beaks. It is white-chaffed at maturity, with oval kernels that are wide and shallow at the crease. It has milling and baking quality similar to Treasure and is significantly better than Penawawa for break flour yield, total flour yield, cookie diameter, and cookie top grain score. At the time of release it was resistant to stripe rust (adult plant resistance) and stem rust and moderately susceptible to leaf rust. It was evaluated as Entry 1052 in the UC Regional Cereal Testing program from 1994-2001 for spring planting in the intermountain region of northern California. *Crop Science 37: 1010 (1997)*

STERLING
Sterling is a soft white spring wheat. It was released by the by the USDA-ARS and the Idaho, Oregon, and Colorado AESs in 1980. It was selected from the cross Fielder/4/2*A6535S-443-107/3/Springfield//PI 227196/A63166S-A-2-8. Its experimental designation was IDO144. Sterling is similar to Fielder in most agronomic and seed characteristics and it is difficult to distinguish between them. Sterling averages 1, 2, and 3 days earlier in maturity than Fielder, Twin, and Fieldwin, respectively. It averages 2 cm shorter that Twin and Dirkwin, and 5 cm shorter than Fieldwin and has good straw strength. Spikes are erect to inclined, awned, fusiform to oblong, and mid-dense. Glumes are white, long, and mid-wide with narrow oblique to square shoulders. Beaks are narrow, acuminate, and 2-5 mm long. Kernels are soft, white, ovate, and mid-long and have a narrow, mid-deep crease and rounded cheeks. Sterling has satisfactory milling and pastry quality similar to that of Fielder. At the time of release it was moderately resistant to leaf rust and stripe rust and moderately susceptible to powdery mildew. It subsequently became susceptible to stripe rust and leaf rust. It was evaluated as Entry 722 in the UC Regional Cereal Testing program from 1986-1991 for spring planting in the intermountain region of northern California. *Crop Science 24:621-622 (1984)*

SUNSTAR PROMISE
Sunstar Promise is a soft white spring wheat. It was released by Sunderman Breeding Co. in 1995. It was selected from the cross Centennial 2*/Fieldwin. Its experimental designation was SDM 406. It is a semi-dwarf with fair straw strength. It is medium early maturing (similar in heading to Fieldwin). At the time of release it was resistant to stripe rust and moderately resistant to leaf rust and BYD. It subsequently became moderately susceptible to leaf rust and BYD. It was evaluated as Entry 1054 in the UC Regional Cereal Testing program from 1994-1998 for spring planting in the intermountain region of northern California.

SUPER DIRKWIN
Super Dirkwin is a soft white spring wheat. It was released by Resource Seeds, Inc. and the Idaho AES in 2005. It

was selected from the cross Centennial*3/Dirkwin. Its experimental designation was A9526S-A-10. It is released as a stripe rust resistant replacement for Dirkwin. It is most similar to Dirkwin. At the time of release it was resistant to stripe rust, but subsequently became susceptible to stripe rust and Septoria tritici leaf blotch. It was evaluated as Entry 1385 in the UC Regional Cereal Testing program from 2002-2005 for spring planting in the intermountain region of northern California and for fall planting (for green-chop forage) in the Sacramento and northern San Joaquin Valleys and south central coast regions of California.

TREASURE
Treasure is a soft white spring wheat. It was developed cooperatively by the USDA-ARS and the Idaho AES and released by the USDA-ARS and the Idaho and Oregon AESs in 1986. It was selected from the cross Blueboy II/4/7*Springfield/3/Asosan/Federation//A63167S-A-1-50-45-5/ID0016//Penjamo 'S'/Gabo 55. Its experimental designation was ID0248. It is a semi-dwarf with intermediate height (similar to Owens), fair lodging resistance (slightly better than Owens), and intermediate maturity (heads 1 day late than Twin, 2 days later than Dirkwin, and 4 days later than Owens). Spikes are awned with white glumes. Milling and pastry quality is superior to that of Owens. At the time of release it was resistant to stripe rust and stem rust, moderately susceptible to leaf rust, powdery mildew, and black chaff, and susceptible to Hessian fly. It subsequently became susceptible to stripe rust. It was evaluated as Entry 653 in the UC Regional Cereal Testing program in 1984 and from 1986-1996 for spring planting in the intermountain region of northern California. *Crop Science 28:576 (1988)*

UI CATALDO
Caltaldo is a soft white spring wheat. It was developed by the University of Idaho. It was selected from the cross IDO584/4*Alturas. Its experimental designation was ID0642. It has an Alturas background with the H25 gene for Hessian fly resistance. It is a semi-dwarf and is medium maturing, 1 day earlier in heading than Alturas. It has good straw strength. At the time of release it was resistant to stripe rust and Hessian fly. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1527 in the UC Regional Cereal Testing program in 2006 and in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-2011 for spring planting in the intermountain region of northern California.

UI PETTIT
UI Pettit is a soft white spring wheat. It was released by the Idaho Agricultural Experiment Station in 2006. It was selected from the cross Pomerelle*2/Fujimi Komugi. Its experimental designation was IDO632. It is a semi-dwarf and is shorter than other available cultivars and has good straw strength. It is most similar in appearance to Alturas. UI Pettit has an unpigmented coleoptile and erect juvenile growth. It has a twisted, recurved flag leaf and an awned, erect, lax head, which is white-chaffed at maturity. Seed is soft, white, ovate, with rounded cheeks and large (36 mg) kernels, similar in size to Jubilee. It is medium early maturing. Average heading date is 5 days earlier than Alturas, 6 days earlier than Penawawa, and 7 days earlier than Jubilee. At the time of release it was moderately resistant to stripe rust and susceptible to the Hessian fly. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1528 in the UC Regional Cereal Testing program in 2006 and in the Oregon Spring Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2009-2010 for spring planting in the intermountain region of northern California.

URQUIE
Urquie is a soft white spring wheat. It was released by the Washington and Idaho AESs and the USDA-ARS in 1975. It was selected from the cross Gaines/Marfed Sel. 68-3. Its experimental designation was WA 5876. It is a tall semi-dwarf and has cold tolerance (winter survival) distinctly superior to Marfed when fall-sown in Washington. It is one of the first of a series of cold hardy or facultative spring wheats under development at Washington State University. It is slightly later (1-2 days) in heading than Marfed. It carries mature plant, temperature-sensitive resistance to stripe rust. It is awned and has white chaff and medium-lax spikes. Seeds are longer than those of Marfed, but similar to those of Gaines and Nugaines. It has superior milling properties as well as dual-purpose (pastry and bread) baking qualities. At the time of release it was resistant to stripe rust, moderately susceptible to powdery mildew, and susceptible to leaf rust and dryland root rot. It was evaluated as Entry 399 in the UC Regional Cereal Testing program from 1980-1981 for spring planting in the intermountain region of northern California. *Crop Science 16:742 (1976)*

VANNA

Vanna is a soft white spring wheat. It was released by Western Plant Breeders in 1993. It was selected from a soft white spring wheat male sterile facilitated recurrent selection population (SWS MSFS Population). Its experimental designation was BZ684-23. It is an awned semi-dwarf with intermediate height, good lodging resistance and intermediate maturity. At the time of release it was resistant to stripe rust, leaf rust, and powdery mildew, moderately susceptible to stem rust, Septoria tritici leaf blotch and BYD, and susceptible to Hessian fly. It was evaluated as Entry 1007 in the UC Regional Cereal Testing program from 1993-1999 for spring planting in the intermountain region of northern California.

WADUEL
Waduel is a soft white spring wheat. It was released by the Washington AES. It was selected from the cross K74182/Potam 70. Its experimental designation was WA 7187. It is early maturing and has poor straw strength. At the time of release it was susceptible to leaf rust. It was evaluated as Entry 727 in the UC Regional Cereal Testing program in 1987 and from 1989-1991 for spring planting in the intermountain region of northern California.

WADUEL 94
Waduel 94 is a soft white spring wheat. It was released by the Washington Agricultural Experiment Station in 1994. It was selected from the cross K74182/Potam 70, Sel. 51. Its experimental designation was WA 7715. It is medium maturing and has poor straw strength. At the time of release it was resistant to stripe rust, moderately resistant to leaf rust, and moderately susceptible to BYD. It was evaluated as Entry 1123 in the UC Regional Cereal Testing program from 1996-1997 for spring planting in the intermountain region of northern California.

WAKANZ
Wakanz is a soft white spring wheat. It was released by the Washington Agricultural Experiment Station in 1988. Its experimental designation was WA 7183. It is awned and medium height with late maturity. It is moderately resistant to lodging. At the time of release it was resistant to Hessian fly, moderately resistant to stripe rust and leaf rust, moderately susceptible to powdery mildew, and susceptible to stem rust. It was evaluated as Entry 763 in the UC Regional Cereal Testing program from 1987-1989 for spring planting in the intermountain region of northern California.

WALLADAY
Walladay is a soft white spring wheat. It was released by Washington State University in 1978. It is a pure line selection from the cultivar Luke. It is a facultative, cold-hardy spring wheat that can be planted either in the spring or in the fall. It is a semi-dwarf with awns, white glumes, and mid-late maturity. It has poor straw strength. At the time of release it was moderately resistant to stripe rust and leaf rust and susceptible to powdery mildew. It was evaluated as Entry 575 in the UC Regional Cereal Testing program from 1982-1984 for spring planting in the intermountain region of northern California.

WAWAWAI
Wawawai is a soft white spring wheat. It was released by the Washington AES in 1994. It was selected from the cross K82382/K82407. Its experimental designation was WA07712. It is awned and medium-tall with midseason maturity. It has poor straw strength. At the time of release it was resistant to stem rust, powdery mildew, and Hessian fly, moderately resistant to stripe rust and leaf rust, and moderately susceptible to BYD. It subsequently became moderately susceptible to stripe rust. It was evaluated as Entry 1122 in the UC Regional Cereal Testing program from 1996-1997 for spring planting in the intermountain region of northern California.

WHITEBIRD
Whitebird is a soft white spring wheat. It was released by the Idaho, Oregon, and Washington AESs and USDA-ARS in 1996. It was selected from the cross Owens/ID000159. Its experimental designation was ID0392. It is meant as a replacement for Fieldwin and Penawawa. It is a semi-dwarf with dark green foliage, erect juvenile growth habit, intermediate maturity (heads about 3 days earlier than Treasure and 2 days later than Centennial), intermediate height (about 2 cm shorter than Fieldwin), and good lodging resistance (comparable to Penawawa and significantly better than Treasure). Heads are lax, awned with glumes that are long, medium wide, with square shoulders and an acuminate beak. It has white chaff. Seed is elliptical with a wide, shallow crease. Grain milling and baking qualities are similar to Treasure. It has significantly better quality than Penawawa, with higher milling yield and larger diameter cookies. At the time of its release it was resistant to stripe rust, moderately resistant to leaf rust and stem

rust, and moderately susceptible to Septoria tritici leaf blotch and BYD. It subsequently became moderately resistant to stripe rust and moderately susceptible to leaf rust. It was evaluated as Entry 1010 in the UC Regional Cereal Testing program from 1993-2001 for spring planting in the intermountain region of northern California. *Crop Science 37:1009 (1997)*

ZAK
Zak is a soft white spring wheat. It was developed by the Agricultural Research Center of Washington State University in cooperation with the Idaho and Oregon AESs and the USDA-ARS and jointly released by the Washington, Oregon and Idaho AESs and USDA-ARS in 2000. It was selected from the cross Pavon 'S'/5/PI167822/CI13438 113-6//Idaed/Marfed 68-5/4/Lemhi 66/3/Yaktana 54A*4/Norin 10/Brevor/6/Walladay/7/ PI506355/8/Treasure. Its experimental designations were WA 7850, W9400154, and K89792. Zak was released as a replacement for Wawawai, Penawawa and Alpowa in the northeastern and southeastern production regions of Washington based on its tolerance to Hessian fly, high grain yield, superior stripe rust resistance and superior end-use quality. It has mid-season maturity (heads 2 days later than Wawawai, 1 day earlier than Alpowa, and on the same day as Penawawa) and is an intermediate height semi-dwarf (average plant height is 89 cm, 5 cm shorter than Wawawai, equal to Alpowa, and 5 cm taller than Penawawa). It has lax, fusiform spikes with white awns and medium length, white glumed spikes with mid-long to long kernels that are white, soft, and ovate. Seed has a midsize germ with a narrow, mid-deep crease, rounded cheeks, and a short, non-collared brush. It has outstanding end product quality compared to other varieties and carries high molecular weight glutenin subunits of null (1A), 6+8 (1B) and 2+12 (1D). At the time of release it was resistant to stripe rust (high temperature adult plant resistance) and Hessian fly, moderately resistant to leaf rust, and susceptible to Russian wheat aphid. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1338 in the UC Regional Cereal Testing program from 2001-2003 for spring planting in the intermountain region of northern California. *Crop Science 42:661-662 (2002)*

CULTIVAR ARCHIVES (Cultivars previously evaluated by UC Small Grains Program)
SOFT WHITE WINTER WHEAT

BARBEE
Barbee is a soft white winter club wheat. It was developed by the Washington AES and released in 1976. It was selected from the cross Omar/Vogels 1834-Sel.3//PI 178383/CI 13431. Its experimental designations were WA 5826 and VD 67211. It has a very dense bearded spike with brown glumes that are mid-long and mid-wide. The kernels are ovate, white, soft, and short with a shallow crease. The germ is small. It is similar to Paha in maturity and winter hardiness. Milling characteristics are similar to Nugaines. It produces excellent pastry-type flour. At the time of release it was resistant to stripe rust, flag smut, common bunt, and some races of dwarf bunt, and susceptible to leaf rust and Cercosporella foot rot. It was evaluated as Entry 509 in the UC Regional Cereal Testing program from 1982-1985 for fall planting in the intermountain region of northern California. *Crop Science 17:675 (1977)*

BASIN
Basin is a soft white winter wheat. It was developed by Columbia Basin Seeds and released in 1985. It is a selection from Nugaines. It is awned, with white chaff. It is mid-late maturing, short-medium height with good lodging resistance, and has excellent winter hardiness. At the time of release it was resistant to common bunt, moderately resistant to dwarf bunt and stripe rust, moderately susceptible to leaf rust and flag smut, and susceptible to snow mold. It was evaluated as Entry 1188 in the UC Regional Cereal Testing program from 1998-2000 and in 2002 for fall planting in the intermountain region of northern California.

BITTERROOT
Bitterroot is a soft white winter wheat. It was developed by the Idaho AES and released in 2007. It was selected from the cross DH-31/4/Lewjain/3/RDL/SU92//KAL/BB. Its experimental designation was ID92-22407A. Bitterroot was released for its tolerance to Cephalosporium stripe, yield potential, straw strength, and superior end-use quality. It is adapted for both irrigated and intermediate to high rainfall production systems in Idaho and the Pacific Northwest. It is a semidwarf, similar in height to Tubbs 06 and 2 to 3 inches taller than Stephens. It is blue-green in color with semi-erect flag leaves. Heading date is similar to Tubbs 06 and 2 days later than Brundage 96. It has good straw strength and similar lodging response to Tubbs 06. Glumes are awned and the seed is intermediate is size. Bitterroot has excellent end-use quality,

equaling or exceeding Brundage 96. At the time of release it was moderately resistant to stripe rust, had moderate to excellent tolerance to Cephalosporium stripe, and was moderately susceptible to dwarf bunt. It subsequently became moderately susceptible to stripe rust. It was evaluated in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-2010 for fall planting in the intermountain region of northern California.

BRUEHL
Bruehl is a soft white winter club wheat. It was developed by the Agricultural Research Center of Washington State University in cooperation with the University of Idaho AES and USDA-ARS and released in 2001. It was selected from the cross UNA(NS1971)/5/Oasis/4/Luke//Itana/CItr1343(WA6362)/3/Luke Mutant 14(WA6242)/6/Tres/Eltan. Its experimental designations were WA 7833 and VO95435. Bruehl is a semi-dwarf that matures 2 to 3 days earlier than Eltan, but under snow mold pressure will mature up to 7 days earlier. It has poor straw strength. Spikes are awned, elliptical, mid-dense and erect. Glumes are glabrous, white, mid-long, mid-wide; shoulders oblique to rounded; and beaks mid-wide, acuminate, 0.5 to 1.5 mm in length. Kernels have club characteristics: white, soft, mid-long, ovate; germ small; crease mid-wide, mid-deep; cheeks rounded; and brush midsized and mid-long. Bruehl has excellent overall club soft white wheat quality traits. At the time of release it was highly resistant to snow mold, resistant to dwarf bunt, expressed adult plant resistance to stripe rust, and was moderately susceptible to leaf rust, stem rust, eyespot and Cephalosporium stripe. It was evaluated as Entry 1282 in the UC Regional Cereal Testing program from 2002-2003 for fall planting in the intermountain region of northern California. *Crop Science 41:2006-2007 (2001)*

CASTAN
Castan is a soft white winter wheat. It was developed in France. It has good straw strength. It was evaluated as Entry 535 in the UC Regional Cereal Testing program from 1982-1984 for fall planting in the intermountain region of northern California.

CHUKAR
Chukar is a soft white winter club wheat. It was developed cooperatively by the USDA-ARS and the Washington and Oregon AES and released in 2001. It was selected from the cross WA7665/Rulo. Its experimental designation was WA 7855. It has late-season maturity for Washington. It possesses the Pch1 gene which confers resistance to strawbreaker foot rot. It is white-chaffed with dense clavate heads with tip awns. It has medium, smooth, and elliptical kernels with asymmetrical sides and rounded cheeks. The brush is short, not collared. It has excellent confectionary milling and baking quality. At the time of release it was resistant to stripe rust and powdery mildew, moderately susceptible to leaf rust, and susceptible to dwarf bunt, Hessian fly, snow mold, and BYD. It was evaluated as Entry 1454 in the UC Regional Cereal Testing program from 2005-2006 for fall planting in the intermountain region of northern California.

CODA
Coda is a soft white winter club wheat. It was developed by the USDA-ARS in cooperation with the Washington, Idaho, and Oregon AES and released in 1998. It was selected from the cross Tres//Madsen/Tres. Its experimental designation was WA 7752. It is a semi-dwarf with awned compact spikes, midseason maturity, white straw and chaff. It has poor straw strength. Kernels are white, soft, short to mid-long, and humped. The germ is small. Coda carries HMW glutenin subunits of null (Glu 1A), 6 (Glu 1B), and 2+12 (Glu 1D). It rates satisfactory to excellent for club wheat milling, flour and baking quality. At the time of release it had resistance to several pathotypes of stripe rust, was heterogeneous for adult plant resistance to stripe rust, had moderate resistance to strawbreaker foot rot, leaf rust, and powdery mildew, partial tolerance to Cephalosporium stripe, and susceptibility to common bunt, dwarf bunt, and stem rust. It was evaluated as Entry 1285 in the UC Regional Cereal Testing program from 2002-2004 and in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-2011 for fall planting in the intermountain region of northern California. *Crop Science 40:578-579 (2000)*

DAWS
Daws is a soft white winter wheat. It was developed cooperatively by the USDA-ARS and the Washington State Agricultural Research Center and released in 1976. It was selected from the cross CI14484//CI13645/PI178383. Its experimental designation was WA 6099. Daws is more winter hardy than Nugaines. It has a bearded lax spike with long, mid-wide, white glumes. The kernels are elliptical, white, soft, and mid-long, with a shallow crease. The germ

is midsize. Milling characteristics are similar to Nugaines; Daws produces satisfactory pastry-type flour. At the time of release it was resistant to stripe rust and common bunt, and susceptible to dwarf bunt, flag smut, leaf rust, stem rust, and Cercosporella foot rot. It was evaluated as Entry 500 in the UC Regional Cereal Testing program from 1982-1985 for fall planting in the intermountain region of northern California. *Crop Science 17:674-675 (1977)*

EDWIN
Edwin is a soft white winter club wheat. It was developed by the Washington State University Agricultural Research Center in cooperation with the USDA-ARS and released in 2000. It was selected from the cross Jacmar/Stephens//Tres/4/PI 67822/CItr13438//Luke/3/Paha. Its experimental designation was WA 7834. It was developed as a replacement for Moro. It is a short, standard height wheat with mid-season maturity. It has excellent emergence and straw strength. Winter hardiness and snowmold resistance are similar to Eltan. It has elliptical, dense, awnless, white glumed spikes with kernels that are white, short, soft, and ovate. It has a small germ with a mid-wide crease, rounded cheeks and a mid-short to short brush. It has excellent club wheat quality characteristics. At the time of release it had adult plant stripe rust resistance, was moderately resistant to eyespot, cephalosporium stripe, and speckled snow mold, and was moderately susceptible to leaf rust and stem rust. It was evaluated as Entry 1284 in the UC Regional Cereal Testing program from 2002-2003 for fall planting in the intermountain region of northern California. *Crop Science 40:1198 (2000)*

ELTAN
Eltan is a soft white winter wheat. It was developed cooperatively by the USDA-ARS and Washington State University and released in 1990. It was selected from the cross Luke//BR70443-4, PI167822/CI13438. Its experimental designation was WA 7431. It is a late maturing semi-dwarf with plant height about 1" taller than Daws, and moderately weak straw. Spikes are lax, awned, with mid-wide, white glumes. Kernels are elliptical, white, soft, and mid-long with a shallow crease. The germ is mid-sized. It has good winter hardiness. Eltan has satisfactory milling and baking quality. At the time of release it was resistant to dwarf bunt and common bunt, tolerant to snow mold, moderately susceptible to stripe rust, Cephalosporium stripe, and strawbreaker foot rot, and susceptible to stem rust and leaf rust. It was evaluated as Entry 962 in the UC Regional Cereal Testing program from 1991-1996 for fall planting in the intermountain region of northern California. *Crop Science 31:1704 (1991).*

FARO
Faro is a soft white winter wheat. It was released by the Oregon and Washington AESs in cooperation with USDA-ARS in 1976. It was selected from the cross Suwon 92/3*Omar//Moro. Its experimental designation was OR7147. Faro is similar to Moro in maturity and winter hardiness. Plant height is medium short. Straw strength is poor. The spike is very dense and awnletted; the glumes are brown, mid-long and mid-wide; the shoulders are mid-wide and generally oblique; the beaks are mid-wide, obtuse. Kernels are ovate, white, soft, and short with a mid-deep crease and a small germ. Faro produces excellent pastry-type flour. At the time of release it was resistant to stripe rust and to some races of common bunt and dwarf bunt, and susceptible to leaf rust. It was evaluated as Entry 396 in the UC Regional Cereal Testing program from 1982-1986 for fall planting in the intermountain region of northern California. *Crop Science 18:1095 (1978)*

FINCH
Finch is a soft white winter wheat. It was developed by the USDA-ARS with assistance from the Washington and Oregon AESs and released in 2001. It was selected from the cross Dusty//WA7164/Dusty. Its experimental designations were WA7794 and WA 7853. Finch was released because of its yield potential and disease resistance combined with the excellent end-use quality characteristics desired for soft white wheat in the Pacific Northwest. The appearance of Finch is most similar to Madsen with coleoptiles and auricles that lack anthocyanin, semi-erect juvenile plant growth, and hollow internodes. The plant color at boot stage is green. Finch is late maturing with an average heading date 1 day later than Eltan and 6 days later than Madsen. Finch is a semi-dwarf with height equal to Madsen and Eltan. Spikes are lax, awned, and fusiform and inclined at maturity. Glumes are glabrous, white, long and mid-wide with oblique shoulders and narrow, acuminate beaks, 2-3 mm in length. Kernels are soft and white, 6-8 mm in length, 3-4 mm wide with an oval shape and sides tapering at both ends. Kernel surface texture is smooth, the germ is medium to large and rounded to oblong. The brush is light, germ angle is low, cheeks are rounded to sharp, and the crease is straight and flared at tips. At the time of release it was resistant to strawbreaker foot rot, moderately resistant to stripe rust (possesses high temperature adult plant resistance), powdery mildew, and Cephalosporium stripe; moderately susceptible to leaf rust; and susceptible to Hessian Fly, snow mold, and BYD. It was evaluated as

Entry 1453 in the UC Regional Cereal Testing program from 2005-2006 for fall planting in the intermountain region of northern California. *Crop Science 45:1656-1657 (2005)*

FOOTE
Foote is a soft white winter wheat. It was developed by the Oregon AES and released in 1998. It was selected from the cross Heima//Kalyansona/ Bluebird/3/WWP7147, F1 /4/D6301/Heines VII//ERA/3/Buckbuck. Its experimental designation was OR880172. The pedigree represents a combination of winter and spring type parents. Foote is widely adapted to most winter wheat growing areas in the Pacific Northwest; however, it is superior yield-wise to existing cultivars only in the Willamette Valley and areas where *Septoria tritici* is a major limiting factor. Foote is similar to Stephens in heading date, taller, slightly weaker strawed, and similar in winter hardiness. It is a semi-dwarf with white, stiff straw. The spike is awned, oblong, dense, and nodding. Glumes are glabrous, white, mid long; shoulders narrow, wanting; beaks narrow, acuminate, 2-3 mm. Awns are 2-7 cm long. The kernels are white, mid-long, soft, elliptical with midsize germ and a narrow, shallow crease. The brush is small. It is very similar in its overall quality properties to Stephens and Madsen. Despite considerable genotype x environment interactions involving these traits, it has softer kernels and superior sponge cake volume and sponge cake score. At the time of release it was resistant to Septoria tritici leaf blotch, powdery mildew, stripe rust, leaf rust, Pseudocercosporella foot rot, and common bunt. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1197 in the UC Regional Cereal Testing program from 1999-2000 and in 2002 for fall planting in the intermountain region of northern California.

GENE
Gene is a soft white winter wheat. It was released by the Oregon AES in 1992. It was selected from the cross Cleo/Pichon//Zenzontli. Its experimental designation was OR830801. It is a semi-dwarf, several inches shorter than Stephens, with excellent lodging resistance and early maturity (about 5-10 days earlier than Stephens). It is less winter hardy than Stephens. Spikes are awnletted, fusiform, mid-dense, and nodding. Glumes are glabrous, white, short to mid-long, shoulder mid-long, square, beaks narrow, acute, and 2-3 mm long. Kernels are white, mid-long, soft, ovate with a small to mid-sized germ and a mid-wide, deep crease. The brush is small. Gene has satisfactory to very satisfactory overall soft white winter wheat quality traits and is similar to Stephens for most quality traits. At the time of release it was resistant to Septoria tritici leaf blotch and to prevalent races of stripe rust and leaf rust, moderately resistant to powdery mildew, and susceptible to Septoria nodorum glume blotch, flag smut, common bunt, dwarf bunt, and Cephalosporium stripe. It subsequently became susceptible to Septoria tritici leaf blotch and stripe rust. It was evaluated as Entry 966 in the UC Regional Cereal Testing program from 1990-1991, 1993-1996, and 1998-1999 for fall planting in the intermountain region of northern California, as a forage wheat for late fall planting in the Central Valley and surrounding areas, and in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-2010 for fall planting in the intermountain region of northern California. *Crop Science 34:538 (1994)*

HILL 81
Hill 81 is a soft white winter wheat. It was released by the Oregon AES in cooperation with USDA-ARS in 1983. It was selected from the cross Yamhill/Hyslop. Its experimental designation was OWW68007-2M6. Hill 81 has a winter growth habit, a rapid emergence rate, and a high level of winter hardiness. It is mid-tall, with stiff straw and mid-season maturity. Spikes are awned, fusiform, mid-dense, and inclined. Glumes are white, glabrous, mid-long, and mid-wide with wanting shoulders. Awns are 3-8 cm long. Beaks are 3-4 mm long. Kernels are white, mid-long, elliptical with a mid-sized germ. Creases are narrow to mid-wide. Cheeks are rounded. Hill 81 has excellent overall soft wheat quality characteristics. At the time of release it was resistant to common bunt, had moderate adult plant resistance to stripe rust and leaf rust, was moderately susceptible to powdery mildew and Septoria tritici blotch, and susceptible to strawbreaker foot rot. It was evaluated as Entry 524 in the UC Regional Cereal Testing program from 1982-1987 for fall planting in the intermountain region of northern California. *Crop Science 22:1266 (1982)*

HILLER
Hiller is a soft white winter club wheat. It was developed by the Washington Agricultural Research Center in cooperation with USDA-ARS and the Idaho and Oregon AESs and released in 1998. It was selected from the cross N10B14//Hybrid53, 101/3/Odin/4/Elgin19/Elmar//N10B1813, 4/5/ N10B14//Hybrid53, 101/3/Metzger 722712/6/Tres. Its experimental designation was WA 7729. Hiller is an early season, 1-gene semi-dwarf. It is less prone to lodging and winter injury than most other club wheat cultivars. It has an elliptical to clavate, dense, erect

spike having awnless to awnletted white glumes. Kernels are white, short, soft, ovate to elliptical with a small germ, a mid-wide and shallow crease, rounded cheeks, and mid-short to short brush. It has excellent club wheat milling, flour and baking quality. At the time of release it was resistant to stripe rust (race specific and nonspecific resistance), moderately resistant to leaf rust and powdery mildew, moderately susceptible to stem rust and dwarf bunt, and susceptible to strawbreaker foot rot and Cephalosporium stripe. It was evaluated as Entry 1283 in the UC Regional Cereal Testing program from 2002-2003 for fall planting in the intermountain region of northern California. *Crop Science 39:1531-1532 (1999)*

HUBBARD

Hubbard is a soft white winter wheat. It was developed by the Idaho AES and released in 2000. It was selected from the cross Hill 81/Augusta. Its experimental designation was ID86-10420A. It is an awned, tall semi-dwarf with good to excellent yield potential in the intermediate to high rainfall areas of the Pacific Northwest. Hubbard is blue-green in color with erect to semi-erect flag leaves that tend to lie perpendicular to the stem after full extension of the spike. Heading date for Hubbard is intermediate, similar to that observed with Madsen and about 3 days later than Stephens. Hubbard has good to excellent straw strength showing little or no lodging under both rainfed and irrigated conditions. It has a moderate level of winter hardiness, similar to Hill 81. Glumes of Hubbard are awned and seed is intermediate in size, white, and soft. Hubbard has good to excellent soft white winter wheat end-use quality. At the time of release it was moderately resistant to stripe rust, expressed an intermediate level of tolerance to Cephalosporium stripe, and was susceptible to strawbreaker foot rot, Septoria tritici leaf blotch, common bunt, and dwarf bunt. It was evaluated as Entry 1390 in the UC Regional Cereal Testing program from 2003-2006 for fall planting in the intermountain region of northern California. *Crop Science 44:1469-1470 (2004)*

HYAK

Hyak is a soft white winter club wheat. It was jointly released by the USDA-ARS and the Washington, Idaho, and Oregon AESs in 1988. It was selected from the cross VPM1/Moisson 421//2*Tyee. Its experimental designation was WA 7166. It is a one-gene semi-dwarf (mid-tall) with early-midseason maturity. It is moderately resistant to lodging with moderate cold hardiness. Spikes are elliptical, very dense, and erect with awnlets that range from 2-20 mm at the spike apex. Glumes are glabrous, white, mid-long and mid-wide. Shoulders are oblique to round and beaks mid-wide, acute, 0.5-1.5 mm in length. Kernels are white, soft, short, ovate to oval. Germ is small. Crease is mid-wide, and mid-deep. Cheeks are rounded and the brush is mid-sized, short to mid-long. Hyak has satisfactory to very satisfactory overall soft white club wheat quality traits. At the time of release it was resistant to strawbreaker foot rot, moderately resistant to stripe rust, leaf rust, and stem rust, and susceptible to powdery mildew, flag smut, common bunt, Cephalosporium stripe, dwarf bunt and snow mold. It was evaluated as Entry 755 in the UC Regional Cereal Testing program from 1986-1988, 1990-1991, and from 1993-1995 for fall planting in the intermountain region of
northern California. *Crop Science 30:234 (1990)*

HYSLOP

Hyslop is a soft white winter wheat. It was released by the Oregon AES in 1971. It was selected from the cross Nord Desprez/2*(Pullman Sel. 101, CI 13438). Its experimental designation was Cor. 63-112-66-2. It is a semi-dwarf with stiff straw. Spikes are awned, oblong, erect to inclined with glabrous, white, mid-wide glumes. The shoulders are wanting with acuminate beaks 2-10 mm long. Kernels are white, mid-long, soft, and ovate and have a small germ and a narrow, deep crease. Hyslop has milling and baking properties equal to other cultivars available at the time of its release. At the time of release it was resistant to common bunt, stripe rust, moderately resistant to powdery mildew, Septoria tritici leaf blotch, and leaf rust, and moderately susceptible to flag smut. It was evaluated as Entry 138 in the UC Regional Cereal Testing program from 1982-1984 for fall planting in the intermountain region of northern California. *Crop Science 12:398 (1972)*

IDAHO 587

Idaho 587 is a soft white winter wheat. It was developed by the Idaho AES and released in 2003. It was selected from the cross Stephens*4/FS4. Its experimental designations were W99–12–6 and IDO587. Idaho 587 is a backcross derivative of the soft white winter wheat cultivar Stephens with genetic tolerance to the imidazolinone class of herbicides developed by the BASF Corporation for use in controlling grassy weeds of wheat and generically given the name ‘Clearfield’. Idaho 587 is most similar to the cultivar Stephens with an unpigmented coleoptile, dark-green foliage, and a prostrate to semi-erect fall growth habit. Idaho 587 is a semi-dwarf, approximately 85 cm tall at

maturity, similar to Stephens and Madsen, but taller than Brundage 96. Like Stephens, Idaho 587 is a medium maturity cultivar, heading approximately a day earlier than Stephens and 4 days earlier than Madsen. It has broad, recurved flag leaves, is awned, with yellow anthers at anthesis, and white-colored chaff at maturity. It has large, plump, oval, soft white seed with a wide crease, short brush, midsized embryo, and an average seed size of 46 mg. Winter hardiness of Idaho 587 is similar to Stephens (greater than 90% stand average for both genotypes). At the time of release Idaho 587 had resistance (similar to Stephens) to stripe rust that is conditioned by both seedling and adult plant resistance genes, and was susceptible to snow mold. It was evaluated as Entry 24 in the 2007 Oregon Winter Wheat Elite Yield Test conducted in cooperation with the UC Regional Cereal Testing program for fall planting in the intermountain region of northern California. *Crop Science 46:1387-1388 (2006)*

KMOR

Kmor is a soft white winter wheat. It was developed cooperatively by the USDA-ARS and Washington State University and released in 1990. It was selected from the cross Luke/VH067375/4/*Aegilops ventricosa*/*Triticum persicum*//Marne*3/3/Moisson. Its experimental designation was WA 7529. It is a medium to late maturing semi-dwarf with moderately weak straw and good winter hardiness. Spikes are lax, awned, with long, mid-wide, white glumes. Kernels are elliptical, white, soft, and mid-long with a shallow crease. The germ is mid-sized. Kmor has satisfactory soft white wheat milling and baking quality. At the time of release it was resistant to stripe rust, moderately resistant to Cephalosporium stripe, strawbreaker foot rot, common bunt and dwarf bunt, moderately susceptible to BYD, and susceptible to stem rust, leaf rust, and snow mold. It was evaluated as Entry 961 in the UC Regional Cereal Testing program from 1990-1998 for fall planting in the intermountain region of northern California. *Crop Science 31:1704-1705 (1991)*

LAMBERT

Lambert is a soft white winter wheat. It was developed by the Idaho AES and jointly released with the Oregon and Washington AESs in 1994. It was selected from the cross Stephens/Sprague. Its experimental designation was ID85-153. It is an early maturing, awned, blue-green semi-dwarf with good straw strength and white chaff at maturity. Lambert is similar in heading date, straw strength, and winter hardiness to Stephens, but is 5-8 cm taller. Glumes are white, with an acuminate beak. The kernels are white, soft, and ovate, with a midsized germ and a mid-deep crease. Lambert has good flour yield, low flour ash, and superior sponge cake volume. Cookie diameter average and hardness values are higher than for Stephens. At the time of release it was resistant to stripe rust, tolerant to Cephalosporium stripe, moderately susceptible to Septoria tritici leaf blotch, and susceptible to dwarf bunt, Pseudocercosporella foot rot, and leaf rust. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1058 in the UC Regional Cereal Testing program from 1996-2000 and from 2002-2006 for fall planting in the intermountain region of northern California. *Crop Science 35:1222 (1995)*

LEWJAIN

Lewjain is a soft white winter wheat. It was developed cooperatively by the USDA-ARS and the Washington Agricultural Research Center and released in 1982. It was selected from the cross Luke/3/Super Helvia//Suwon 92/CI13645. Its experimental designation was WA 6363. Lewjain in similar to Luke in maturity (late), straw strength (weak), winter hardiness (moderate) and milling and flour quality characteristics (excellent). Lewjain has an awned, lax spike with long, mid-wide, white glumes. The kernels are elliptical, white, soft and mid long, with a shallow crease. The germ is mid-sized. At the time of release it was resistant to common bunt, dwarf bunt, stripe rust (adult plant resistance), moderately resistant to Cephalosporium stripe, and susceptible to leaf rust, stem rust, flag smut, and Cercosporella foot rot. It was evaluated as Entry 525 in the UC Regional Cereal Testing program from 1982-1985 for fall planting in the intermountain region of northern California. *Crop Science 23:1014 (1983)*

MACVICAR

MacVicar is a soft white winter wheat. It was released by the Oregon AES in 1992. It was selected from the cross Yamhill/Mcd/2/*T.spelta*/3/Su92. Its experimental designation was ORF75336. It is a semi-dwarf with good lodging resistance. It has a Malcolm/Stephens background, tolerance to early season root diseases, and consistently lower grain protein content than other commonly grown soft white winter wheat cultivars available at the time of its release. At the time of evaluation it was resistant to leaf rust and moderately resistant to BYD. It was evaluated as Entry 965 in the UC Regional Cereal Testing program from 1993-1998 for fall planting in the intermountain region of northern California.

MADSEN
Madsen is a soft white winter wheat. It was jointly released by the USDA-ARS and the Washington, Idaho, and Oregon AESs in 1988. It was selected from the cross VPM1/Moisson 951//2*Hill 81. Its experimental designation was WA 7163. It is a one-gene semi-dwarf, medium early in heading, and similar to Nugaines. Madsen is similar to Hill 81 in agronomic characteristics (slightly earlier in maturity) but is more resistant to strawbreaker foot rot. It has excellent straw strength. It is similar to Stephens in winter hardiness. Spikes are awned, oblong, mid-dense, inclined and have a tendency to shatter. Glumes are heterogeneous for color (white or buff), glabrous, mid-long, and mid-wide to narrow. Shoulders are narrow and wanting. Beaks are narrow, acuminate, and 3-15 mm long. Kernels are white, mid-long, soft, and ovate. The germ is mid-sized. The crease is mid-wide and mid-deep. Cheeks are rounded to angular. The brush is mid-sized to mid-long. Madsen is satisfactory to very satisfactory for overall quality traits. At the time of release it had moderately high resistance to strawbreaker foot rot, field resistance to stripe rust, leaf rust and stem rust, moderate resistance to powdery mildew and BYD, and susceptibility to Cephalosporium stripe and dwarf bunt. It subsequently became moderately susceptible to stripe rust. It was evaluated as Entry 963 in the UC Regional Cereal Testing program from 1990-1998 and in 2000 and 2002 and in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-2011 for fall planting in the intermountain region of northern California. *Crop Science 29:1575-1576 (1989)*

MALCOLM
Malcolm is a soft white winter wheat. It was released by the Oregon AES in 1987. It was selected from the cross Stephens//63189-66-7/Bezostaya. Its experimental designations were OWW72339 and ORCW 8113. Malcolm is a semi-dwarf (similar in height to Stephens) with resistance to lodging, early-midseason maturity, and fair winter hardiness. It has awned, nodding spikes. Malcolm has good overall soft white wheat milling and baking quality. At the time of release it was resistant to stripe rust (adult plant resistance) and common bunt, and susceptible to dwarf bunt, leaf rust, Septoria tritici leaf blotch, Cephalosporium stripe, BYD, and snow mold. It subsequently became susceptible to stripe rust. It was evaluated as Entry 668 in the UC Regional Cereal Testing program in 1985, from 1987-1988, in 1991, and from 1994-2003 for fall planting in the intermountain region of northern California.

MASAMI
Masami is a soft white winter wheat. It was developed by the Agricultural Research Center of Washington State University in cooperation with the USDA-ARS. Masami was jointly released by Washington and Idaho AESs and the USDA-ARS in 2004. It was released for its excellent grain yield, cold hardiness, end-use quality and disease resistance. It was selected from the cross MacVicar (PI 552427)/PI 561031. Its experimental designations were WA 7916, VO95065, and V89046. Masami is an intermediate height, semi-dwarf cultivar. Masami has intermediate juvenile plant growth habit, and flag leaves are erect and not twisted. The average plant height of Masami is 92 cm, which is 2 cm taller than Madsen and Rod, 1 cm shorter than Eltan. The heading date of Masami is similar to Madsen and Rod, and 2 days earlier than Eltan. Spikes are fusiform and mid-dense, with white awns and white glumes that are of medium length and width, wanting shoulders and acuminate beaks. Kernels are ovate, white, soft, and mid-long. Seed of Masami has a midsize germ with a narrow, mid-deep crease, rounded cheeks with a midsize, short brush. Masami has acceptable quality for domestic soft white winter wheat uses. At the time of release it was resistant to eyespot, stripe rust (high temperature adult plant resistance), leaf rust, and powdery mildew, and moderately resistant to Cephalosporium stripe and dwarf bunt. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1416 in the UC Regional Cereal Testing program in 2004 and in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-2009 for fall planting in the intermountain region of northern California. *Crop Science 46:476-477 (2006)*

MCDERMID
McDermid is a soft white winter wheat. It was developed by the Oregon AES in cooperation with the USDA-ARS and released in 1976. It was selected from the cross Nord Desprez/7/(Pullman Sel. 101, CI 13438, (Norin 10/Brevor CI 13253, Sel. 14)6/(Turkey Red/Florence//Fortyfold/Federation/4/Oro//Turkey Red/Florence/3/Oro/Fortyfold//Federation/5/Rio/Rex. Its experimental designation was OR 63-130-66-5. It is a semi-dwarf that performed well under low and higher moisture conditions. The spike is awned, fusiform, mid-dense, and inclined with glabrous, white mid-long glumes. The shoulders are mid-wide and oblique, with narrow, acuminate, 1-3 mm long beaks. Awns are white and 2-8 cm in length. Kernels are white, mid-long, ovate with a small germ and mid-wide crease, which is shallow to mid-deep. Mcdermid had overall quality characteristics equal to or superior to common wheat cultivars available at the time of release. At the time of release it was resistant to stripe rust (adult plant resistance), leaf rust,

and common bunt, and moderately resistant to powdery mildew. It was evaluated as Entry 219 in the UC Regional Cereal Testing program in 1982 and 1985 for fall planting in the intermountain region of northern California. *Crop Science 16:745 (1976)*

MORO
Moro is a soft white winter club wheat. It was released by USDA-ARS and Oregon AES in 1965. It was selected from the cross PI 178383/*2Omar. PI 178383 is an introduction from Turkey. Its experimental designation was AUS 11865. Moro has a winter growth habit and is mid-tall with moderately stiff straw and mid-season maturity (about 2 days earlier than Omar). Spikes are awnletted, club-shaped, with brown chaff. At the time of release it was resistant to many races of stripe rust and common and dwarf bunt and tolerant to Cercosporella foot rot. It was evaluated as Entry 137 in the UC Regional Cereal Testing program in 1987 and from 1990-1991 for fall planting in the intermountain region of northern California. *Crop Science 6: 502 (1966)*

NUGAINES
Nugaines is a soft white winter wheat. It was developed cooperatively by the USDA-ARS and the Washington State Agricultural Research Center and released by USDA-ARS and Washington, Idaho, and Oregon AESs in 1965. It was selected from the cross (Norin 10/Brevor, CI 13253, Sel. 14)/6/(Sel. 3, CI 12692, Orfed/5/(Hybrid 50, Turkey Red/ Florence//Fortyfold/Federation/4/Oro//Turkey Red/Florence/3/Oro//Fortyfold/Federation))/7/Burt. It is a sister line of Gaines. Its experimental designations were WA 3739 and AUS 10673. Nugaines has a winter growth habit, with winter hardiness equal to that of Gaines. It is medium early maturing and short-statured with good straw strength. Spikes are awned and lax with long, mid-wide, white glumes. Kernels are white, soft, and mid-long with a shallow crease. Nugaines has good milling and flour quality for pastries, cookies, and other soft white wheat products. At the time of release it was resistant to stripe rust (adult plant resistance), moderately resistant to common, flag, and stinking smuts, and susceptible to Cercosporella foot rot, Fusarium foot rot, stem rust, and snow mold. At the time of evaluation it was moderately susceptible to Septoria tritici blotch and susceptible to leaf rust. It was evaluated as Entry 72 in the UC Regional Cereal Testing program from 1982-1991 for fall planting in the intermountain region of northern California. *Crop Science 14:609 (1974)*

ORCF-101
ORCF-101 is a soft white winter wheat. It was developed by the Oregon AES and released in 2003. It was selected from the cross FS-4/Malcolm//SPN/Madsen. Its experimental designations were OR2010051 and OWW72339. It is a Clearfield wheat (resistant to the herbicide “Beyond”, imidazolinone) released for its utility for grassy weed control (goatgrass, wild rye, downy brome, Italian ryegrass, wild oat) and acceptable quality for the soft white market class. CV-9804, also known as FS-4, developed through mutagenesis of the cultivar Fidel, is the donor of the Clearfield trait. Heading date averages 2 days later than Stephens and 2 days earlier than Madsen. Plant height averages 1.5 inches taller than Stephens and 0.4 inches shorter than Madsen. ORSF-101 has good straw strength and winter hardiness similar to Malcolm, Stephens, and Madsen. ORSF-101 has quality attributes very similar to Stephens, Madsen and Tubbs and is acceptable for soft wheat applications. At the time of release it was resistant stripe rust (adult plant resistance), moderately susceptible to Septoria tritici leaf blotch, crown rot, and Cephalosporium stripe, and susceptible to strawbreaker foot rot and leaf rust. It subsequently became moderately susceptible to stripe rust. It was evaluated as Entry 1433 in the UC Regional Cereal Testing program from 2004-2005 and in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-2011 for fall planting in the intermountain region of northern California. ORCF 101R, a reselection of ORCF 101, was developed by the Oregon AES and will replace the original ORCF 101 (while retaining the name ORCF 101) in 2012. ORCF 101R was evaluated in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2009-2011 for fall planting in the intermountain region of northern California.

ORCF-102
ORCF-102 is a soft white winter wheat. It was developed by the Oregon AES and released in 2004. It was selected from the cross Madsen/CV-9804//Weatherford. Its experimental designation was OR2010007. It is a Clearfield wheat (resistant to the herbicide “Beyond”, imidazolinone) released for its utility for grassy weed control (goatgrass, wild rye, downy brome, Italian ryegrass, wild oat), improved disease resistance relative to available Clearfield cultivars, and acceptable quality for the soft white market class. CV-9804, also known as FS-4, developed through mutagenesis of the cultivar Fidel, is the donor of the Clearfield trait. Heading date averages 2 days later than Stephens and 0.5 to 1 day earlier than Madsen. Plant height averages 8.2 cm taller than Stephens and 6 cm taller than

Madsen. ORCF-102 has quality attributes similar to Stephens, Madsen, Tubbs, and ORCF-101 and is acceptable for soft wheat applications. At the time of release it was resistant to strawbreaker foot rot and stripe rust (adult plant resistance), tolerant to Cephalosporium stripe, moderately resistant to Septoria tritici leaf blotch and crown rot, and susceptible to leaf rust. It subsequently became moderately susceptible to stripe rust. It was evaluated as Entry 1456 in the UC Regional Cereal Testing program from 2005-2006 and in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-2011 for fall planting in the intermountain region of northern California.

ORCF-103

ORCF-103 is a soft white winter wheat. It was developed by Oregon Agricultural Experiment Station, Oregon State University, in cooperation with BASF Corporation and USDA-Agricultural Research Service, and released in 2008. ORCF-103 is derived from the three-way cross Eltan/3/CV9804//OR939481. CV-9804, also known as FS-4, is the donor of the CLEARFIELD trait, developed through mutagenesis of the cultivar Fidel. OR939481 is a selection from the cross Stephens/Madsen. ORCF-103 was tested under the experimental designation OR12042037. It is a Clearfield wheat (resistant to the herbicide "Beyond", imidazolinone) released for its utility for grassy weed control (goatgrass, wild rye, downy brome, Italian ryegrass, wild oat). ORCF-103 follows the release of OSU CLEARFIELD cultivars ORCF-101 and ORCF-102 in 2003 and 2004, respectively. ORCF-103 is released for its utility for grassy weed control in the Pacific Northwest and complementary adaptation to ORCF-101 and ORCF-102. The primary advantage of ORCF-103, as compared ORCF-101 and ORCF-102, is improved winter cold-tolerance and tolerance to snow mold. ORCF-103 is about four days later in heading than ORCF-101 and ORCF-102. Plant height is similar to Madsen, about 2 inches less than Tubbs or Eltan. Straw strength is fair to poor, most similar to Eltan. At the time of release, ORCF-103 was moderately resistant to stripe rust, tolerant to Fusarium crown rot and susceptible to strawbreaker footrot and dwarf bunt. It was evaluated in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2009-2011 for fall planting in the intermountain region of northern California. *(Washington Crop Improvement Association website: http://washingtoncrop.com/seed/varieties.asp*)

ROD

Rod is a soft white winter wheat. It was developed cooperatively by Washington State University and USDA-ARS and jointly released by the Washington, Idaho and Oregon AESs and USDA-ARS in 1992. It was selected from the cross Luke/Daws//Hill 81. Its experimental designation was WA 7662. It is a semi-dwarf, similar in height to Stephens, with weaker straw and later maturity. It averages about 2 inches shorter than Madsen and matures about 2 days later than Madsen. It has winter hardiness similar to Stephens. Spikes are awned, clavate, with long, mid-wide, white glumes. Kernels are elliptical, white soft, and mid-long with a shallow crease. The germ is mid-sized. It has satisfactory milling and baking quality, similar to Nugaines, Daws, and Stephens. At the time of evaluation it was resistant to common bunt, moderately resistant to stripe rust, moderately susceptible to Cephalosporium stripe and leaf rust, and susceptible to stem rust, Septoria tritici leaf blotch, snow mold, dwarf bunt, BYD, and strawbreaker foot rot. It was evaluated as Entry 960 in the UC Regional Cereal Testing program from 1990-2000 and from 2002-2006 for fall planting in the intermountain region of northern California. *Crop Science 35: 594 (1995)*

ROHDE

Rohde is a soft white winter club wheat. It was jointly released by the Oregon AES, the Washington Agricultural Research Center, and the Idaho AES in 1993. It was selected from the cross Paha//Selection 72//Daws. Its experimental designation was OR 855. It is a semi-dwarf with intermediate height and good straw strength. It has early-midseason maturity and heads 1-2 days later than Hyak. It has low winter hardiness, similar to Stephens. Spikes are awned, clavate, short, compact, and laterally compressed. Glumes are glabrous and bronze. Kernels are small, white, soft, and laterally compressed with a short brush and a narrow, shallow crease. Rohde has slightly lower flour yields than Tres and Hyak, but similar milling score. Cookie diameters are similar to Tres and larger than Hyak. Sponge cake volume is slightly lower than Tres and Hyak. At the time of release it was resistant to stripe rust (adult plant resistance), moderately resistant to Cephalosporium stripe and common bunt, moderately susceptible to leaf rust, powdery mildew and Septoria tritici leaf blotch, and susceptible to strawbreaker foot rot. It was evaluated as Entry 967 in the UC Regional Cereal Testing program in 1990, from 1993-2000 and from 2002-2005 for fall planting in the intermountain region of northern California. *Crop Science 34: 1127 (1994)*

RULO

Rulo is a soft white winter club wheat. It was released by Washington State University in 1994. It was selected from

the cross Tyee/Roazon/Tres 92-1. Its experimental designation was WA 7622. It was intended as a replacement for Hyak. It is a semi-dwarf with intermediate winter hardiness, similar to Tres, and fair straw strength. At the time of release it was resistant to stripe rust and strawbreaker foot rot, moderately resistant to leaf rust, stem rust and Septoria tritici leaf blotch, moderately susceptible to Cephalosporium stripe and BYD, and susceptible to dwarf bunt and common bunt. It was evaluated as Entry 1059 in the UC Regional Cereal Testing program from 1995-1998 for fall planting in the intermountain region of northern California.

SIMON

Simon is a soft white winter wheat. It was released by the University of Idaho and USDA-ARS in 2002. It was selected from the cross Haven/Lambert//Madsen. Its experimental designation was ID 91-34302A. It is earlier heading than Madsen. It has good agronomic characteristics and good end-use quality in areas of moderate to high rainfall or under irrigation. At the time of release it was resistant to stripe rust, had Pseudocercosporella foot rot resistance similar to Madsen, less physiological leaf spot than Madsen, and good tolerance to Cephalosporium stripe. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1415 in the UC Regional Cereal Testing program from 2004-2006 and as Entry 11 in the 2007 Oregon Winter Wheat Elite Yield Test conducted in cooperation with the UC Regional Cereal Testing program for fall planting in the intermountain region of northern California.

SALUTE

Salute is a soft white winter wheat developed by AgriPro Wheat and released in 2007. Its experimental designation was 99X 1008-2. Salute is a medium height semidwarf and has white chaff at maturity. It has medium-early maturity and good straw strength. Salute is best adapted to higher rainfall dryland production in eastern Washington, west-central Idaho and northeastern Oregon and dryland production along the Highway 2 corridor of Washington. Juvenile growth habit is semi-erect. Plant color at boot stage is blue green. Anther color is yellow. Auricle anthocyanin and auricle hairs are present. Flag leaf at boot stage is erect and twisted. Head shape is strap and heads are awned. Glumes are long in length and wide in width. Glume shoulder shape is oblique with long acuminate beaks. Seed shape is ovate to elliptical. Brush hairs on the seed are long in length and occupy a large area of the seed tip. Seed depth is shallow and width is narrow. Seed cheeks are rounded. At the time of release it was resistant to stripe rust, moderately resistant to snow mold, moderately susceptible to dwarf bunt, and susceptible to strawbreaker footrot. It subsequently became susceptible to stripe rust. It was evaluated in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-2010 for fall planting in the intermountain region of northern California. (*Washington Crop Improvement Association website: http://washingtoncrop.com/seed/varieties.asp*)

TEMPLE

Temple is a soft white winter club wheat. It was released by the Oregon AES in 1998. It was selected from the cross Tres/VPM1. Its experimental designations were 92CL0054 and OR92CL0054. It is standard height with white, moderately stiff straw. It is shorter and earlier heading than Paha and Omar, and taller than Tres, Hyak, and Rohde. The spike is awnless, elliptical, dense and erect. Glumes are glabrous, white, short; shoulders are narrow, rounded; beaks are obtuse, 1-2 mm long. The kernels are white, short, soft, ovate, with hump, with a small midsize germ and narrow, shallow crease with rounded cheeks. The brush is small. It is superior for test weight, flour yield, overall mill score and cookie diameter, and slightly less in cake volume compared to Tres, Paha and Omar. At the time of release it was resistant to stripe rust and strawbreaker foot rot. It was evaluated as Entry 1199 in the UC Regional Cereal Testing program from 1999-2000 and from 2002-2003 for fall planting in the intermountain region of northern California.

TRES

Tres is a soft white winter club wheat. It was developed cooperatively by the USDA-ARS and Washington State University and released in 1984. It was selected from the cross Suwon 92/6*Omar/3/*T. spelta*/Coastal//3*Omar. Its experimental designations were WA 79-8 and WA 6698. It is a medium height semi-dwarf, resistant to lodging, with mid-season maturity. Heading date averages 1 day later than Faro and one day earlier than Paha. Winter hardiness is similar to Faro. Spikes are club-shaped, compact and awnletted with white glumes. Kernels are white, short, soft, and ovate. Germs and brushes are small. Tres has very satisfactory club wheat milling and flour quality characteristics. It is a component of Multiline WA 6472, Crew, CItr 17951. At the time of release it was resistant to stripe rust and leaf (adult plant resistance), moderately resistant to powdery mildew, moderately susceptible to strawbreaker foot rot and BYD, and susceptible to flag smut, dwarf bunt, common bunt and Cephalosporium stripe. It was evaluated as Entry 756 in the UC Regional Cereal Testing program from 1987-1988, 1990-1991, and from 1993-1998 for fall planting in the

intermountain region of northern California. *Crop Science 26: 203-204 (1986)*

TUBBS 06
Tubbs 06 is a soft white winter wheat. It was developed by Oregon State University in cooperation with USDA Agricultural Research Service and released in 2006. Tubbs 06 is a reselection of the cultivar Tubbs (from the cross Malcolm/Madsen) with reduced susceptibility to prevalent races of stripe rust. Tubbs 06 is similar to Tubbs, averaging 0.5 days later in heading than Tubbs (which averages 2 days later than Stephens) and 0.43 inches greater in plant height. Tubbs 06 has fair straw strength, and winterhardiness similar to Tubbs. Tubbs 06 carries VPM-1 resistance to strawbreaker footrot. At the time of release it was susceptible to Cephalosporium stripe and dwarf bunt, moderately susceptible to crown rot and Septoria tritici leaf blotch, had adequate resistance to leaf rust, and was resistant to common bunt. It subsequently became susceptible to stripe rust. It was evaluated in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-2011 for fall planting in the intermountain region of northern California. *(Washington Crop Improvement Association website: http://washingtoncrop.com/seed/varieties.asp*)

UICF-BRUNDAGE
UICF-Brundage is a soft white winter wheat. It was developed by the Idaho AES and released in 2009. It was selected from the cross FS4/Brundage*2//Brundage 96 *3. Its experimental designation was ID00859. It is a white chaffed, awnletted, semidwarf with resistance to the herbicide imazamox (a Clearfield wheat, resistant to the herbicide "Beyond"). It has yield potential, agronomic characteristics, and end-use quality properties similar to Brundage 96. It is blue-green in color. It has midseason maturity, with heading date slightly later than Brundage. It has erect to semi-erect flag leaves and excellent straw strength. Glumes are white, with an oblique shoulder and obtuse beak. Kernels are white, soft, ovate with a mid-sized germ and a mid-deep to deep crease. It is susceptible to strawbreaker foot rot and dwarf bunt, and although it has high temperature adult plant resistance, it has become moderately susceptible to stripe rust. It was evaluated in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-2011 for fall planting in the intermountain region of northern California. *(Washington Crop Improvement Association website: http://washingtoncrop.com/seed/varieties.asp*)

WB-523
WB-523 is a soft white winter wheat. It was developed by Westbred LLC and released in 2008. It was derived from the cross Malcolm/Madsen//Cashup. Its experimental designation was BU6W00-523. It is a medium maturity, semidwarf with fair to good straw strength. The spike of WB-523 is awned, with white chaff at maturity. The spike is mid-dense, strap shaped and inclined at maturity. The seed is elliptical in shape and has a mid-sized embryo and a large brush with medium length hairs. The cheeks are angular and the crease is mid-wide and mid-deep. At the time of release it was resistant to stripe rust and moderately resistant to strawbreaker footrot and snow mold. It was evaluated in the Oregon Winter Wheat Elite Yield Trial conducted in cooperation with the UC Regional Cereal Testing program from 2007-2008 and in 2010 for fall planting in the intermountain region of northern California. *(Washington Crop Improvement Association website: http://washingtoncrop.com/seed/varieties.asp*)

WEATHERFORD
Weatherford is soft white winter wheat. It was released by the Oregon AES in 1998. It was selected from the cross Malcolm/3/VPM/MOS951//Hill/4/VPM/MOS951//2*Hill. Its experimental designation was OR898120. It is a semi-dwarf with stiff straw. Heading date is similar to Madsen and later than Stephens. Weatherford is taller than either cultivar and similar in winter hardiness to Stephens. The spike is awned, fusiform, mid-dense, and nodding. Glumes are glabrous, white, mid-long; shoulders are narrow, acuminate, 2-3 mm long. Awns are 2-7 cm long. The kernels are white, mid-long, soft, elliptical with a small to midsize germ, a narrow, mid-deep crease and rounded cheeks. The brush is small. Weatherford is superior to Stephens and Madsen in sponge cake volume and cake score, and similar to them in other milling and baking characteristics. At the time of release it was resistant or moderately resistant to stripe rust, leaf rust, common bunt, powdery mildew, Septoria tritici leaf blotch, BYD, and strawbreaker foot rot (eyespot), moderately susceptible to dwarf bunt, and had mixed reactions to Cephalosporium stripe and flag smut. It was evaluated as Entry 1198 in the UC Regional Cereal Testing program from 1999-2000 and from 2002-2005, and as Entry 4 in the 2007 Oregon Winter Wheat Elite Yield Test conducted in cooperation with the UC Regional Cereal Testing program for fall planting in the intermountain region of northern California.

CULTIVAR ARCHIVES (Cultivars previously evaluated by UC Small Grains Program)
HARD RED WINTER WHEAT

ANDREWS
Andrews is a hard red winter wheat. It was released in 1987 by Washington State University and USDA-ARS. It was selected from the cross PI167822/CI13438//CI9342/Itana/3/CI17271//Sturdy. It is a medium height semi-dwarf with early to midseason maturity. Spikes are awned, oblong to fusiform, mid-dense to lax. Glumes are glabrous, white, and mid-long. Kernels are red, mid-long, hard, ovate to elliptical in shape, with a small germ and a mid-long, mid-size brush. The crease is mid-wide and mid-deep. The cheeks are rounded. Winterhardiness is less than that of Hatton or Weston. Andrews typically has poor semi-dwarf emergence characteristics. It is resistant to lodging. At the time of release it had adult plant resistance to stripe rust, resistance to common bunt and snow mold, moderate resistance to dwarf bunt, and susceptibility to Cephalosporium stripe, strawbreaker foot rot, Fusarium root rot, stem rust and leaf rust. It was evaluated as Entry 757 in the UC Regional Cereal Testing program in 1988 and from 1993-1997 for fall planting in the intermountain region of northern California. *Crop Science 31:1387 (1991)*

ARCHER
Archer is a hard red winter wheat. It was developed by North American Plant Breeders. It was selected from the cross CO695461(F6)*Centurk. It was evaluated as Entry 534 in the UC Regional Cereal Testing program from 1982-1985 for fall planting in the intermountain region of northern California.

BATUM
Batum is a hard red winter wheat. It was developed cooperatively by Washington State University and USDA-ARS and released in 1985. It was selected from the cross CI13438/Redmond//CI 13694/5/PI 178383/CI 13431//CI 13441 /3/Itana/4/Bezostaja 1//CI 13438/Burt. Its experimental designation was WA 6816. It is a semi-dwarf. Emergence is similar to soft white semi-dwarfs. It is high tillering and awned with medium spikes. It has late maturity. Straw is weaker than other hard red winter cultivars. Grain production is higher than Hatton and Wanser by 10-37%. At the time of release it was susceptible to dwarf bunt, snowmold, stem rust, and strawbreaker foot rot, resistant to local races of stripe rust and common bunt, and had some tolerance to mildew, leaf rust, and flag smut. It was evaluated as Entry 754 in the UC Regional Cereal Testing program from 1986-1988 for fall planting in the intermountain region of northern California. *Crop Science 31:1386 (1991).*

BLIZZARD
Blizzard is a hard red winter wheat. It was developed cooperatively by the University of Idaho and USDA-ARS and released in 1989. It was selected from the cross A68203W-E-1-3-3/A68203W-A-1-6-1; A68203W = Utah 216c-12-10/Cheyenne/5/PI 476212/4/Burt/3/Rio/Rex//Nebred. Its experimental designation was ID0297. Plants are tall, awned, with stiff straw and erect to inclined heads. It has superior milling quality. At the time of release it was very resistant to existing races of common and dwarf bunt, tolerant to snow mold, and susceptible to stripe rust. It was evaluated as Entry 816 in the UC Regional Cereal Testing program in 1988 for fall planting in the intermountain region of northern California. *Crop Science 31:490 (1991)*

BONNEVILLE
Bonneville is a hard red winter wheat. It was released by the Idaho AES and USDA-ARS in 1994. It was selected from the cross A774125W-16-3-1/A7470W-11-2 = Utah216c-12-10/Cheyenne/5/PI 476212/4/Burt/3/Rex/Rio// Nebred/6/Kiowa/Utah222a-437-2//Dm/3/PI 476212/MT6619/4/McCall/El Gaucho/3/Kiowa/Utah233-3-10/Burt. Its experimental designation was ID0421. Bonneville was intended as a higher yielding replacement for Survivor. Bonneville is most similar in appearance to Survivor, with a prostrate juvenile growth habit with blue green foliage and a waxy bloom. It is a semi-dwarf with plant height about 3 inches taller than Manning and maturity similar to Nugaines. It has poor straw strength. Spikes are mid-dense, erect, and awned. Glumes are long, medium wide, with a wanting shoulder and a mid-wide acute beak. Chaff is white at maturity. Kernels are elliptical in shape with angular cheeks and a long brush. The crease is mid-wide and shallow. Milling quality is similar to Blizzard and Survivor. Baking quality is similar to Manning. At the time of release it was resistant to dwarf bunt, snow mold and prevalent races of stripe rust, moderately resistant to leaf rust and moderately susceptible to BYD. It subsequently became susceptible to stripe rust. It was evaluated as Entry 964 in the UC Regional Cereal Testing program from 1993-1995 for fall planting in the intermountain region of northern California. *Crop Science 35:1218-1219 (1995)*

BOUNDARY
Boundary is a hard red winter wheat. It was released by the Idaho AES and USDA-ARS in 1997. It was selected from the cross A76327W-2-3T-5P/A7457W-13-1-1T-2P = Norin 10/Brevor //2*Centana, ID034/3/Centana *2/ CI 14106/5/II60-155/CI 14106//McCall/4/Kiowa/UT222a-437-2//Delmar/3/PI 476212/MT6619. Its experimental designation was ID0467. It is a semi-dwarf adapted to the high yield production zones of the Pacific Northwest. Boundary has a prostrate juvenile growth habit with blue green foliage and no waxy bloom. Boundary flowers moderately late. Mature height is approximately 90 cm, 20 cm taller that Garland and 5 cm shorter than Manning. Boundary is stiff-strawed with greater resistance to lodging than most dryland hard red winter cultivars. Spikes are dense, clavate, and awnless. Glumes are long, medium wide, with a squared shoulder shape and an acute beak. Boundary has white chaff color. Seed is ovate in shape with rounded cheeks and a medium long brush. The seed crease is narrow and shallow. Boundary has good quality characteristics. At the time of release it was moderately resistant to dwarf bunt, had adult plant resistance to stripe rust, and was resistant to Pacific Northwest races of leaf rust and powdery mildew. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1136 in the UC Regional Cereal Testing program from 1998-2000 and 2002-2005 for fall planting in the intermountain region of northern California. *Crop Science 39:296 (1999)*

DECLO
Declo is a hard red winter wheat. It developed by Sunderman Seeds. It was derived from the cross Neeley/2*Stephens//2*Borah. Its experimental designation was SDM 215-2. It is intermediate in height between Promontory and Garland. It has erect flag leaves and green foliage with bloom. Heads are moderately dense and awned. Glume and awn color at maturity are yellowish-light-tan. It has better lodging resistance than Garland. Seed shape is ovate with narrow mid-deep crease. Cheek shape is rounded. The test weight is similar to Promontory and roughly 2 pounds per bushel heavier than other cultivars. At the time of release, Declo was resistant to stripe rust. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1524 in the UC Regional Cereal Testing program in 2006 for fall planting in the intermountain region of northern California.

DELORIS
Deloris is a hard red winter wheat. It was released by the Utah AES in 2002. It was selected from the cross Arbon/ Hansel//PI 470329/3/Weston/6/Favorit/5/Cirpiz/4/Jang Kwang/2/Atlas 66/Comanche/3/Velvet. Its experimental designation was UT2030-32. It has semi-erect juvenile growth habit. Coleoptile anthocyanin is absent. Heading date is 2 days earlier than Utah-100. The flag leaf is lax and flat. Stems are hollow. The mature plant average height in Utah is 78 cm. It has good straw strength. It is awned, tan chaffed, with oblong, mid-dense, and inclined spikes. The kernel is elliptical with angular cheeks, and has a narrow, mid-deep seed crease, and medium length brush that is not collared. It has a high level of resistance to dwarf bunt derived from PI 178383. At the time of evaluation it was susceptible to stripe rust. It was evaluated as Entry 1388 in the UC Regional Cereal Testing program in 2003 for fall planting in the intermountain region of northern California. *Crop Science 44:695 (2004)*

FINLEY
Finley is a hard red winter wheat. It was developed by the Washington Agricultural Research Center in cooperation with USDA-ARS and released in 2000. It was selected from the cross Weston/3/Hatton sib//Short Wheat/Scout. Its experimental designations were WA7773, N9102104, and NSGC 5593. It has a common-type head, is awned with brown glumes, and has good winterhardiness and emergence. It is tall with fair straw strength and medium maturity and is adapted to low rainfall areas. It is similar to Weston in yield, whole grain protein, and test weight, and superior to Weston in milling quality and equal in baking quality. At the time of release it had satisfactory stripe rust resistance. It was evaluated as Entry 1286 in the UC Regional Cereal Testing program from 2002-2003 for fall planting in the intermountain region of northern California. *Crop Science 40:1197-1198 (2000).*

GARLAND
Garland is a hard red winter wheat. It was released by the Utah AES in 1993. It was selected from the cross Favorite/5/Cirpiz/4/Jang Kwang//Atlas 66/Comanche/3/Velvet/9/Cardon/8/Bannock/7/Columbia/6/Delmar/5/ Hussar/Turkey Red//Ridit/3/Oro/Ridit/4/Norin 10/Brevor. Its experimental designation was UT1706-1. It was released as a replacement for the cultivar Ute to provide superior yield and test weight under irrigated management in areas where powdery mildew is severe. Garland is a semi-dwarf with plant height about 5 inches shorter than Nugaines and maturity similar to Ute. It has excellent straw strength. Spikes are awned, dense, with short, wide glumes. The chaff is tan at maturity. Kernels are ovate, with a medium-long brush and a narrow, medium-deep

crease. Milling and breadmaking characteristics are acceptable. At the time of release it was resistant to leaf rust, stripe rust, powdery mildew and common bunt, moderately resistant to dwarf bunt, and moderately susceptible to BYD. It subsequently became susceptible to stripe rust. It was evaluated as Entry 1013 in the UC Regional Cereal Testing program from 1994-1998 for fall planting in the intermountain region of northern California. *Crop Science 36:208 (1996)*

HATTON
Hatton is a hard red winter wheat. It was developed by the Washington AES. It was selected from the cross PI 142522/2*McCall. It is susceptible to lodging. It was evaluated as Entry 530 in the UC Regional Cereal Testing program from 1982-1983 for fall planting in the intermountain region of northern California.

HOFF
Hoff is a hard red winter wheat. It was released by the Oregon AES in 1992. It was selected from the cross Probstorfer Extrem/Tobari 66. Its experimental designations were HRELT 18 and ORCR 8313. It is a semi-dwarf with weak straw and somewhat lower grain protein, but higher grain yields, than other hard red winter cultivars of the region. It does not have a high degree of winterhardiness. Spikes are awned with white glumes. Kernels are red, long, hard, and elliptical with a mid-sized germ and a mid-wide, shallow crease. The brush is small. It is facultative and can be early-spring planted. It has satisfactory milling and baking properties. At the time of release it was moderately resistant to stripe rust, powdery mildew and strawbreaker foot rot, moderately susceptible to leaf rust and Septoria tritici leaf blotch, and susceptible to BYD, common bunt, dwarf bunt, and Cephalosporium stripe. It was evaluated as Entry 604 in the UC Regional Cereal Testing program from 1983-1985, in 1988, and from 1993-1997 for fall planting in the intermountain region of northern California. *Crop Science 34:538 (1994)*

LONGHORN
Longhorn is a hard red winter wheat. It was submitted for testing by Agricultural Products, AZ. It is late maturing and has good straw strength. At the time of evaluation it was moderately resistant to leaf rust and powdery mildew and moderately susceptible to Septoria tritici leaf blotch and BYD. It was evaluated as Entry 1135 in the UC Regional Cereal Testing program from 1997-1999 for fall-sowing (as a forage wheat) in Central Valley of California.

MANNING
Manning is a hard red winter wheat. It was released by the Utah AES in 1979. It was selected from the cross Delmar /PI 178383//Columbia/4/Delmar/3/UT 175-53//Norin 10/Brevor. Its experimental designation was UT89099. Manning is medium short in stature under typical dryland conditions in Utah. It is medium-early in maturity. Spikes are bronze, awned, oblong to fusiform, mid-dense, and tend to be inclined at maturity. Awns are 5-7 cm long and somewhat flared. Glumes are glabrous, mid-long, mid-wide, with generally square shoulders. Beaks are mid-short and acuminate. The kernel is hard, red, elliptical to ovate, with a midsize germ, mid-deep crease, and rounded cheeks. The brush is short to medium and non-collared. Milling and baking characteristics are good and similar to Hansel. It has strong dough mixing properties. At the time of release it had a high level of resistance to dwarf bunt (derived from PI 178383 and Ridit parentage), moderate tolerance to snowmold, and susceptibility to leaf rust and powdery mildew. It became moderately susceptible to stripe rust. It was evaluated as Entry 533 in the UC Regional Cereal Testing program from 1982-1985 for fall planting in the intermountain region of northern California. *Crop Science 21:636 (1981)*

MERIDIAN
Meridian is a hard red winter wheat. It was released by the Idaho AES and USDA-ARS in 1992. It was selected from the cross A68231W-A-7-5-3/A71111W5-1. Its experimental designation was ID0360. It is a semi-dwarf (several inches taller than Stephens), similar to Nugaines in lodging and maturity. It has winter hardiness superior to that of Stephens and is meant for areas where soft white winter wheat is subject to winter-kill. It has prostrate, dark green juvenile foliage and dark geen leaves at flowering without waxy bloom. Flag leaves are erect and broad with light anthocyanin pigmentation of the auricles. Spikes are mid-dense and awned. Glumes are glabrous with acuminate beaks. The chaff color is white. Kernels are elliptical with angular cheeks, a mid-deep crease, and a mid-long brush. Meridian has good milling, excellent mixing, and acceptable baking characteristics. At the time of release it was moderately resistant to stripe rust and snow mold, moderately susceptible to dwarf bunt and BYD, and susceptible to Russian wheat aphid. It was evaluated as Entry 815 in the UC Regional Cereal Testing program in 1988 and from 1993-1996 for fall planting in the intermountain region of northern California. *Crop Science 33:1101-1102 (1993)*

PROMONTORY
Promontory is a hard red winter wheat. It was released by the Utah AES in 1991. It was selected from the cross Manning/Bezostaya 1. Its experimental designation was UT1567-51. It is similar to Manning and was released to provide superior yield and test weight in low moisture areas infested with dwarf bunt. It has intermediate maturity, good winter hardiness, medium height and good lodging resistance. Juvenile growth is semi-erect. Spikes are lax, awned, and bronze-chaffed. Glumes are mid-long and mid-wide. Kernels are ovate, with medium length brush and mid-wide, mid-deep crease. Milling and baking characteristics are acceptable. At the time of release it was highly resistant to dwarf bunt, resistant to prevalent races of stripe rust, moderately resistant to BYD, and susceptible to leaf rust and snow mold. It subsequently became moderately susceptible to stripe rust. It was evaluated as Entry 968 in the UC Regional Cereal Testing program from 1993-2000 and in 2002 for fall planting in the intermountain region of northern California. *Crop Science 35:1206-1207 (1995)*

VONA
Vona is a hard red winter wheat. It was released by the Colorado AES in 1976. It was selected from the cross II21183/CO 652363//Lancer/KS 62136. Its experimental designation was CO 725049. It is a semi-dwarf released for irrigated and dryland production in the southern and central Great Plains and has good lodging resistance. Vona is early in maturity, heading an average of 1-2 days earlier than Scout 66. The stem is white, strong, and hollow. The spike is awned, dorsoventrally compressed, fusiform, lax, mid-dense, inclined, and shattering resistant. The glumes are white, mid-long, and mid-wide, with oblique shoulders. The beak is mid-wide and 4-7 mm long. The awns are white and average 63 mm long. The kernel is red, mid-long, hard, and ovate with a midsized germ, wide, shallow and rounded crease, and short midsized brush. It has good milling and baking properties and lower winterhardiness than Scout 66. At the time of release it was resistant to stem rust and susceptible to leaf rust. It was evaluated as Entry 529 in the UC Regional Cereal Testing program from 1982-1983 for fall planting in the intermountain region of northern California. *Crop Science 18:695 (1978)*

WANSER
Wanser is a hard red winter wheat. It was released by the Washington AES in 1965. It was selected from the cross Burt/Itana. Its experimental designations were Sel. 34 and AUS 10692. It is medium height with good straw strength, early maturing, and winter hardy. The spike is awned, oblong, dense, and erect to inclined. Glumes are glabrous, brown, and mid-long. Shoulders are mid-wide to narrow, oblique to square. Beaks are mid-wide, acuminate, 1-3 mm long. Awns are brown, 1-6 mm long. Kernels are red, mid-long, hard, and ovate. The germ is small and the crease is mid-wide and deep. Cheeks are rounded and the brush is midsized, short to mid-long. Milling and baking qualities are good; it gives a high yield of low ash flour with good gluten strength and loaf volume. At the time of release it was resistant to stripe rust, bunt, and snow mold, and susceptible to leaf rust, stem rust, and foot rot. It was evaluated as Entry 128 in the UC Regional Cereal Testing program from 1982-1983 for fall planting in the intermountain region of northern California. *Crop Science 12:718 (1972)*

WINRIDGE
Winridge is a hard red winter wheat. It was released by the Montana AES and USDA-ARS in 1981. It was selected from the cross Burt/PI 178383//Winalta/3/Crest. Its experimental designation was MT 77077. It was intended for production in areas requiring dwarf bunt and stripe rust resistance. It is medium-late maturing and has good straw strength. It averages 88 cm in height (6 cm taller than Crest) in Montana dryland trials. It has white straw and glumes, and heads 1-4 days later that Crest. Spikes are upright, awned, and oblong to clavate. Kernels are red, hard, large, and somewhat blunt with a deep crease, high cheeks, and a prominent brush. It is superior to Crest for test weight, milling and baking characteristics, and similar for grain protein content. At the time of release it was resistant to dwarf bunt and stripe rust and less susceptible to Cephalosporium stripe than other winter wheat cultivars grown in Montana. It was evaluated as Entry 528 in the UC Regional Cereal Testing program from 1982-1984 for fall planting in the intermountain region of northern California. *Crop Science 23:1222 (1983)*