IV. CULTIVARS AND GERM PLASM

USDA–ARS NATIONAL SMALL GRAINS GERMPLASM RESEARCH FACILITY
P.O. Box 307, Aberdeen, ID 83210, USA.
www.ars-grin.gov/npgs

National Small Grains Collection wheat germ plasm evaluations.

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The USDA–ARS National Small Grains Collection (NSGC) is one of the several components of the National Plant Germplasm System. The NSGC is a working collection in contrast to the base collection at the National Seed Storage Laboratory (NSSL) at Fort Collins, CO. The numbers of accessions in the NSGC are summarized Table 1.

Table 1. USDA–ARS National Small Grains Collection, April, 2001.

Taxonomy	NSGC Accessions
Triticum	54,140
Hordeum	26,971
Avena	21,094
Oryza	17,357
Aegilops	2,213
Secale	2,078
X Triticosecale	1,974
All Species	126,386

The systematic evaluation of wheat accessions in the NSGC and other elite germ plasm continued to be coördinated or conducted by National Small Grains Germplasm Research Facility (NSGGRF) staff at Aberdeen during 2001.

Descriptors appropriate for wheat have been established in collaboration with the Wheat Crop Germplasm Committee. Field evaluation data are recorded on such descriptors as growth habit, number of days from planting to anthesis (heading), plant height, spike or panicle density, lodging, straw breakage, shattering, and awn and glume characteristics, including color. Special nurseries are grown for that purpose at Aberdeen, Idaho and Maricopa, AZ. Disease and insect evaluations are conducted in collaboration and coöperation with ARS and state experiments station specialists.

Data obtained from evaluations of NSGC germ plasm are entered in the Germplasm Resources Information Network (GRIN) system by the NSGGRF staff in coöperation with the ARS National Germplasm Resources Laboratory, Beltsville, MD. GRIN is a database containing the characteristics and availability of all genetic resources included in the National Plant Germplasm System. The Database Manager is J.D. Mowder, Beltsville, Maryland. The NSGGRF staff interacts with the GRIN system in recording NSGC orders (seed requests), entering a variety of data, and conducting information searches. No evaluations have been conducted to date for descriptors such as drought tolerance; salt tolerance; winterhardiness; resistance to *Cephalosporium* stripe, flag smut, leaf blight, loose smut, snow mold, take-all, tan spot, and WSMV; and protein.

Triticum descriptors with data currently on the GRIN system are summarized in Table 2, p. 274.

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National Small Grains Collection Activities.

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Cultivar name clearance. Breeders in the United States are encouraged to have proposed names for new cultivars checked for duplication. The National Small Grains Collection will be glad to assist you. Send the proposed name to: Harold E. Bockelman, USDA–ARS–NSGC, P.O. Box 307, Aberdeen, ID 83210, Fax 208-397-4165, E-mail to nsgchb@ars-grin.gov. If desired, more than one name may be submitted, listed in order of preference. This will save considerable time if a conflict is found with the first name. Available records (GRIN, CI/PI cards, variety files, etc.) here at Aberdeen are checked for conflicts with the proposed name. If a conflict is found (previous use of the name for that crop), the breeder is requested to submit a different name. If no conflicts are found, the requested name is forwarded to the Federal Seed Lab, Agricultural Marketing Service where the proposed name is checked against the databases they maintain. The Agricultural Marketing Service does not guarantee that its findings are the final word since their is no single, complete name database. This clearance procedure generally requires about four weeks. Trademark searches should be done by the breeder online at **http://www.uspto.gov**.

Elite germ plasm requested. Breeders are encouraged to consider submitting their elite lines for inclusion in the NSGC. Of special interest are lines that have been in uniform nurseries, but are not to be released as cultivars. Histori-

Table 2. National Small Grains Collection evaluation of disease; insect; and agronomic, taxonomic, and quality data for wheat on the GRIN system, updated February, 2002.

Character	Years	Location	Accessions
Disease evaluations.			
Barley Yellow Dwarf Virus	1985–92	Davis, CA	2,287
Barley Yellow Dwarf Virus	1988–94	Urbana, IL	17,517
Soilborne Mosaic Virus	1985–89	Urbana, IL	6,587
Soilborne Mosaic Virus	2000	Manhattan, KS	4,998
Leaf Rust	1983–89,91–95	Manhattan, KS	38,751
Leaf Rust ñ Adult	2000	Manhattan, KS	5,000
Stripe Rust – Adult	1984–2001	Mt. Vernon, WA	36,273
Stripe Rust – Adult	1984–2001	Pullman, WA	27,241
Stripe Rust – PST 17	1984–2001	Pullman, WA	18,832
Stripe Rust – PST 20	1984–95	Pullman, WA	12,508
Stripe Rust – PST 25	1984–95	Pullman, WA	1,682
Stripe Rust – PST 27	1984–95	Pullman, WA	14,511
Stripe Rust – PST 29	1984–95	Pullman, WA	14,259
Stripe Rust – PST 37	1984–2001	Pullman, WA	6,146
Stripe Rust – PST 43	1984–2001	Pullman, WA	5,137
Stripe Rust – PST 45	1984–2001	Pullman, WA	6,138
Stripe Rust – PST 78	2000–01	Pullman, WA	1,835
Stem Rust – Adult	1987–94	Rosemount, MN	8,078
Stem Rust – Adult	1987–94	St. Paul, MN	19,141
Stem Rust – HJCS	1987–92	St. Paul, MN	4,342
Stem Rust – QFBS	1987–92	St. Paul, MN	8,639
Stem Rust – QSHS	1987–92	St. Paul, MN	4,455
Stem Rust – RHRS	1987–92	St. Paul, MN	4,312
Stem Rust – RTQQ	1987–92	St. Paul, MN	8,973
Stem Rust – TNMH	1987–92	St. Paul, MN	4,402
Stem Rust – TNMK	1987–92	St. Paul, MN	8,938
Stem Rust – HNLQ	1987–92	St. Paul, MN	4,705
Stem Rust – RKQS	1987–92	St. Paul, MN	4,682
Stem Rust – Genes	1987–92	St. Paul, MN	1,018
Common Bunt – R36	1981–92	Aberdeen, ID [1]	74
Common Bunt – R39	1981–92	Aberdeen, ID [1]	1,422
Common Bunt – R43	1981–92	Aberdeen, ID [1]	318
Common Bunt – T–1	1981–92	Aberdeen, ID [1]	6,301
Common Bunt – Multiple	1981–2000	Aberdeen, ID [1]	17,366
Dwarf Bunt	1978–2001	Aberdeen, ID [2]	13,702
Septoria nodorum	1970-78	Bozeman, MT	8,095
Powdery Mildew	1996–2001	Kinston, NC	10,258
Fusarium Head Blight/Scab	1998–2001	Brookings, SD	3,207

Table 2 (continued). National Small Grains Collection evaluation of disease; insect; and agronomic, taxonomic, and quality data for wheat on the GRIN system, updated February, 2001.

Character	Years	Location	Accessions
Insect evaluations.			
Hessian Fly – B	1983–94	W. Lafayette, IN	449
Hessian Fly – C	1983–94	W. Lafayette, IN & Manhattan, KS	24,165
Hessian Fly – E	1983–94	W. Lafayette, IN & Manhattan, KS	24,149
Hessian Fly – GP	1983–94	W. Lafayette, IN & Manhattan, KS	14,441
Hessian Fly – L	1983–97	W. Lafayette, IN & Manhattan, KS	8,315
Russian Wheat Aphid (RWA)	1988–95	Stillwater, OK	40,842
Cereal Leaf Beetle	1963–70	Indiana, Michigan	16,347
Agronomic, taxonomic, and quality evaluations.			
Growth Habit	1987–01	Aberdeen, ID	52,828
Chromosome Number	1988–91	Columbia, MO	519
Lysine Content	1966–69	Lincoln, NE	10,367
Awn Color	1983–97	Aberdeen, ID & Maricopa, AZ	22,650
Awn Type	1983–97	Aberdeen, ID & Maricopa, AZ	26,561
Glume Color	1983–97	Aberdeen, ID & Maricopa, AZ	22,812
Glume Pubescence	1983–97	Aberdeen, ID & Maricopa, AZ	24,312
Heading Date	1983–94	Aberdeen, ID & Maricopa, AZ	18,365
Heading Date – related to check	1999–2001	Maricopa, AZ	24,968
Kernel Color	1983–94	Aberdeen, ID & Maricopa, AZ	21,319
Kernels/Spike	1983–94	Aberdeen, ID & Maricopa, AZ	3,666
Kernel Weight	1983–94	Aberdeen, ID & Maricopa, AZ	3,669
Leaf Pubescence	1983–94	Aberdeen, ID & Maricopa, AZ	20,888
Plant Height	1983–97	Aberdeen, ID & Maricopa, AZ	21,841
Plant Height – related to check	1999–2001	Maricopa, AZ	24,958
Rachis Length	1995	Maricopa, AZ	2,512
Shattering	1983–94	Aberdeen, ID & Maricopa, AZ	10,637
Spike Density	1983–98	Aberdeen, ID & Maricopa, AZ	15,823
Spikelets/Spike	1995	Maricopa, AZ	2,502
Spike Type	1983–97	Aberdeen, ID & Maricopa, AZ	15,551
Straw Breakage	1983–94	Aberdeen, ID & Maricopa, AZ	16,829
Straw Color	1983–97	Aberdeen, ID & Maricopa, AZ	19,142
Straw Lodging	1983–94	Aberdeen, ID & Maricopa, AZ	23,075
Core			4,523
Market Class			1,411

[1] 1985–86 Pendleton, OR.
[2] Field tests are conducted at Logan, UT, by Aberdeen ARS staff.

cally, uniform nurseries been the testing grounds for the most advanced, elite germ plasm from the various public and private breeding programs. Entries in uniform nurseries and other breeding materials that are never released as cultivars are still of potential value to breeders, pathologists, entomologists, and other researchers. Breeders should submit 200–500 g of *untreated* seed to the NSGC (address: P.O. Box 307, Aberdeen, ID 83210). Seed from outside of the United States should be sent to the USDA Plant Germplasm Quarantine Center (address: Bldg. 580, BARC-East, Beltsville, MD 20705) with enclosed forwarding directions. Provide a description of the germ plasm, including donor (breeder, institution); botanical and common name; cultivar name and/or other identifiers (breeder line or selection number, etc.); pedigree; descriptive information (of important traits and special characteristics); and growth habit. Assignment of a PI number and inclusion in the NSGC makes the germ plasm available for research purposes to bona fide scientists in the U.S. and worldwide. Please note that a different procedure applies if you are obtaining *Crop Science* registration. Follow directions provided by the crop registration committee.

Guidelines for exporting seed. All seed sent to a foreign country should be inspected and receive a phytosanitary certificate. In most cases, a fee payable to APHIS (Animal & Plant Health Inspection Service) is required to cover the cost of the phytosanitary certificate. You may wish to work with APHIS personnel in your state or your State Department of Agriculture to obtain a phytosanitary certificate. Also, please be aware of any import permits and additional declarations that certain importing countries may require to accompany the shipment.

Guidelines for importing seed. Any scientist importing seed should be aware of any restrictions that apply. APHIS personnel can provide current information on applicable restrictions. Of particular importance to wheat researchers are import restrictions related to flag smut and karnal bunt. Presently, some 34 countries have flag smut import restrictions. Six countries currently have karnal bunt import restrictions. *Importation of seed from flag smut and Karnal bunt countries requires a permit from APHIS.* Special handling and grow-out procedures apply to such shipments.

PI Assignments in *Triticum* from January 2001–February 2002.

PI number	Taxon	Cultivar name or Identifcation number	Country	State/Province
615227	*aestivum* subsp. *aestivum*	Nagyatadi TF	Hungary	
615229	*aestivum* subsp. *aestivum*	Bartweizen	Austria	Upper Austria
615230	*aestivum* subsp. *aestivum*	Sipbachzeller	Austria	Upper Austria
615231	*aestivum* subsp. *aestivum*	Sipbachzeller	Austria	Styria
615232	*aestivum* subsp. *aestivum*	Sipbachzeller	Austria	Upper Austria
615233	*aestivum* subsp. *spelta*	GBXTS-0002	Belgium	Luxembourg
615234	*aestivum* subsp. *spelta*	GBXTS-0003	Belgium	Namur
615235	*aestivum* subsp. *spelta*	GBXTS-0004	Belgium	Luxembourg
615236	*aestivum* subsp. *spelta*	GBXTS-0005	Belgium	Luxembourg
615237	*aestivum* subsp. *spelta*	GBXTS-0006	Belgium	Luxembourg
615238	*aestivum* subsp. *spelta*	GBXTS-0007	Belgium	Luxembourg
615239	*aestivum* subsp. *spelta*	GBXTS-0008	Belgium	Luxembourg
615240	*aestivum* subsp. *spelta*	GBXTS-0009	Belgium	Luxembourg
615241	*aestivum* subsp. *spelta*	GBXTS-0010	Belgium	Luxembourg
615242	*aestivum* subsp. *spelta*	GBXTS-0011	Belgium	Luxembourg
615243	*aestivum* subsp. *spelta*	GBXTS-0012	Belgium	Luxembourg
615244	*aestivum* subsp. *spelta*	GBXTS-0013	Belgium	Luxembourg
615245	*aestivum* subsp. *spelta*	GBXTS-0014	Belgium	Luxembourg
615246	*aestivum* subsp. *spelta*	GBXTS-0015	Belgium	Luxembourg
615247	*aestivum* subsp. *spelta*	GBXTS-0016	Belgium	Luxembourg
615248	*aestivum* subsp. *spelta*	GBXTS-0017	Belgium	Luxembourg
615249	*aestivum* subsp. *spelta*	GBXTS-0018	Belgium	Luxembourg
615250	*aestivum* subsp. *spelta*	GBXTS-0019	Belgium	Luxembourg
615251	*aestivum* subsp. *spelta*	GBXTS-0020	Belgium	Namur
615252	*aestivum* subsp. *spelta*	GBXTS-0021	Belgium	Namur
615253	*aestivum* subsp. *spelta*	GBXTS-0022	Belgium	Luxembourg
615254	*aestivum* subsp. *spelta*	GBXTS-0023	Belgium	Luxembourg
615255	*aestivum* subsp. *spelta*	GBXTS-0024	Belgium	Luxembourg
615256	*aestivum* subsp. *spelta*	GBXTS-0025	Belgium	Luxembourg
615257	*aestivum* subsp. *spelta*	GBXTS-0026	Belgium	Luxembourg
615258	*aestivum* subsp. *spelta*	GBXTS-0027	Belgium	Luxembourg
615259	*aestivum* subsp. *spelta*	GBXTS-0028	Belgium	Luxembourg
615260	*aestivum* subsp. *spelta*	GBXTS-0029	Belgium	Luxembourg
615261	*aestivum* subsp. *spelta*	GBXTS-0030	Belgium	Luxembourg
615262	*aestivum* subsp. *spelta*	GBXTS-0031	Belgium	Luxembourg
615263	*aestivum* subsp. *spelta*	GBXTS-0032	Belgium	Luxembourg
615264	*aestivum* subsp. *spelta*	GBXTS-0033	Belgium	Luxembourg
615265	*aestivum* subsp. *spelta*	GBXTS-0034	Belgium	Luxembourg

PI Assignments in *Triticum* from January 2001–February 2002.

PI number	Taxon	Cultivar name or Identifcation number	Country	State/Province
615266	*aestivum* subsp. *spelta*	GBXTS-0035	Belgium	Luxembourg
615267	*aestivum* subsp. *spelta*	GBXTS-0036	Belgium	Luxembourg
615268	*aestivum* subsp. *spelta*	GBXTS-0037	Belgium	Luxembourg
615269	*aestivum* subsp. *spelta*	GBXTS-0038	Belgium	Luxembourg
615270	*aestivum* subsp. *spelta*	GBXTS-0039	Belgium	Luxembourg
615271	*aestivum* subsp. *spelta*	GBXTS-0040	Belgium	Luxembourg
615272	*aestivum* subsp. *spelta*	GBXTS-0041	Belgium	Luxembourg
615273	*aestivum* subsp. *spelta*	GBXTS-0042	Belgium	
615274	*aestivum* subsp. *spelta*	GBXTS-0043	Belgium	Luxembourg
615275	*aestivum* subsp. *spelta*	GBXTS-0044	Belgium	Luxembourg
615276	*aestivum* subsp. *spelta*	GBXTS-0045	Belgium	Luxembourg
615277	*aestivum* subsp. *spelta*	GBXTS-0046	Belgium	Luxembourg
615278	*aestivum* subsp. *spelta*	GBXTS-0047	Belgium	Namur
615279	*aestivum* subsp. *spelta*	GBXTS-0048	Belgium	Namur
615280	*aestivum* subsp. *spelta*	GBXTS-0049	Belgium	Namur
615281	*aestivum* subsp. *spelta*	GBXTS-0050	Belgium	Namur
615282	*aestivum* subsp. *spelta*	GBXTS-0051f	Belgium	Namur
615283	*aestivum* subsp. *spelta*	GBXTS-0052	Belgium	Namur
615284	*aestivum* subsp. *spelta*	GBXTS-0053	Belgium	Antwerp
615285	*aestivum* subsp. *spelta*	GBXTS-0054	Belgium	Antwerp
615286	*aestivum* subsp. *spelta*	GBXTS-0055	Belgium	Luxembourg
615287	*aestivum* subsp. *spelta*	GBXTS-0056	Belgium	Luxembourg
615288	*aestivum* subsp. *spelta*	GBXTS-0057	Belgium	Luxembourg
615289	*aestivum* subsp. *spelta*	GBXTS-0058	Belgium	Namur
615290	*aestivum* subsp. *spelta*	GBXTS-0059	Belgium	Namur
615291	*aestivum* subsp. *spelta*	GBXTS-0060	Belgium	Namur
615292	*aestivum* subsp. *spelta*	GBXTS-0061	Belgium	Namur
615293	*aestivum* subsp. *spelta*	GBXTS-0062	Belgium	Luxembourg
615294	*aestivum* subsp. *spelta*	GBXTS-0063	Belgium	Luxembourg
615295	*aestivum* subsp. *spelta*	GBXTS-0064	Belgium	Namur
615296	*aestivum* subsp. *spelta*	GBXTS-0065	Belgium	Namur
615297	*aestivum* subsp. *spelta*	GBXTS-0066	Belgium	Namur
615298	*aestivum* subsp. *spelta*	GBXTS-0067	Belgium	Namur
615299	*aestivum* subsp. *spelta*	GBXTS-0068	Belgium	Namur
615300	*aestivum* subsp. *spelta*	GBXTS-0069	Belgium	Namur
615301	*aestivum* subsp. *spelta*	GBXTS-0070	Belgium	Luxembourg
615302	*aestivum* subsp. *spelta*	GBXTS-0071	Belgium	Luxembourg
615303	*aestivum* subsp. *spelta*	GBXTS-0072	Belgium	Luxembourg
615304	*aestivum* subsp. *spelta*	GBXTS-0073	Belgium	Namur
615305	*aestivum* subsp. *spelta*	GBXTS-0074	Belgium	Namur
615306	*aestivum* subsp. *spelta*	GBXTS-0075	Belgium	Namur
615307	*aestivum* subsp. *spelta*	GBXTS-0076	Belgium	Namur
615308	*aestivum* subsp. *spelta*	GBXTS-0077	Belgium	Namur
615309	*aestivum* subsp. *spelta*	GBXTS-0078	Belgium	Luxembourg
615310	*aestivum* subsp. *spelta*	GBXTS-0079	Belgium	Luxembourg
615311	*aestivum* subsp. *spelta*	GBXTS-0080	Belgium	Luxembourg
615312	*aestivum* subsp. *spelta*	GBXTS-0081	Belgium	
615313	*aestivum* subsp. *spelta*	GBXTS-0082	Belgium	
615314	*aestivum* subsp. *spelta*	GBXTS-0083	Belgium	
615315	*aestivum* subsp. *spelta*	GBXTS-0084	Belgium	
615316	*aestivum* subsp. *spelta*	GBXTS-0085	Belgium	

PI Assignments in *Triticum* from January 2001–February 2002.

PI number	Taxon	Cultivar name or Identifcation number	Country	State/Province
615317	*aestivum* subsp. *spelta*	GBXTS-0086	Belgium	
615318	*aestivum* subsp. *spelta*	GBXTS-0087	Belgium	
615319	*aestivum* subsp. *spelta*	GBXTS-0088	Belgium	
615320	*aestivum* subsp. *spelta*	GBXTS-0089	Belgium	Luxembourg
615321	*aestivum* subsp. *aestivum*	Bai Mong Mai	China	
615322	*aestivum* subsp. *aestivum*	Liang Mai	China	
615323	*aestivum* subsp. *aestivum*	Ker Yi 26	China	
615324	*aestivum* subsp. *aestivum*	Zhong Zho 634	China	
615325	*aestivum* subsp. *aestivum*	Yuan Dong 847	China	
615326	*aestivum* subsp. *aestivum*	Fong Kong 8	China	
615327	*aestivum* subsp. *aestivum*	Dong Shieh 1	China	
615328	*aestivum* subsp. *aestivum*	Beijing 837	China	
615329	*aestivum* subsp. *aestivum*	Ng Yi 79-5049	China	
615330	*aestivum* subsp. *aestivum*	Jing Her 90 Jian 4	China	
615335	*aestivum* subsp. *aestivum*	RCAT000120	Hungary	Bekes
615336	*aestivum* subsp. *aestivum*	RCAT000132	Hungary	Szabolcs-Szatmar
615337	*aestivum* subsp. *aestivum*	RCAT000396	Hungary	Szolnok
615338	*aestivum* subsp. *aestivum*	RCAT000403	Hungary	Hajdu-Bihar
615339	*aestivum* subsp. *aestivum*	RCAT000411	Hungary	Veszprem
615340	*aestivum* subsp. *aestivum*	RCAT000038	Hungary	Zala
615341	*aestivum* subsp. *aestivum*	RCAT000051	Hungary	Borsod-Abauj-Zempl
615342	*aestivum* subsp. *aestivum*	RCAT000052	Hungary	Borsod-Abauj-Zempl
615343	*aestivum* subsp. *aestivum*	RCAT000055	Hungary	Pest
615344	*aestivum* subsp. *aestivum*	RCAT000057	Hungary	Csongrad
615345	*aestivum* subsp. *aestivum*	RCAT000059	Hungary	Csongrad
615346	*aestivum* subsp. *aestivum*	RCAT000060	Hungary	Szabolcs-Szatmar
615347	*aestivum* subsp. *aestivum*	RCAT000062	Hungary	Heves
615348	*aestivum* subsp. *aestivum*	RCAT000064	Hungary	Heves
615349	*aestivum* subsp. *aestivum*	RCAT000065	Hungary	Heves
615350	*aestivum* subsp. *aestivum*	RCAT000066	Hungary	Heves
615351	*aestivum* subsp. *aestivum*	RCAT000067	Hungary	Heves
615352	*aestivum* subsp. *aestivum*	RCAT000069	Hungary	Heves
615353	*aestivum* subsp. *aestivum*	RCAT000070	Hungary	Heves
615354	*aestivum* subsp. *aestivum*	RCAT000071	Hungary	Heves
615355	*aestivum* subsp. *aestivum*	RCAT000140	Hungary	Borsod-Abauj-Zempl
615356	*aestivum* subsp. *aestivum*	RCAT000248	Hungary	Fejer
615357	*aestivum* subsp. *aestivum*	RCAT000394	Hungary	Borsod-Abauj-Zempl
615358	*aestivum* subsp. *aestivum*	RCAT000397	Hungary	Veszprem
615359	*aestivum* subsp. *aestivum*	RCAT000398	Hungary	Nograd
615360	*aestivum* subsp. *aestivum*	RCAT000399	Hungary	Nograd
615361	*aestivum* subsp. *aestivum*	RCAT000400	Hungary	Borsod-Abauj-Zempl
615362	*aestivum* subsp. *aestivum*	RCAT000401	Hungary	Pest
615363	*aestivum* subsp. *aestivum*	RCAT000404	Hungary	Bacs-Kiskun
615364	*aestivum* subsp. *aestivum*	RCAT000405	Hungary	Szabolcs-Szatmar
615365	*aestivum* subsp. *aestivum*	RCAT000406	Hungary	Somogy
615366	*aestivum* subsp. *aestivum*	RCAT000408	Hungary	Borsod-Abauj-Zempl
615367	*aestivum* subsp. *aestivum*	RCAT000409	Hungary	Gyor-Sopron
615368	*aestivum* subsp. *aestivum*	RCAT000430	Hungary	Szolnok
615369	*aestivum* subsp. *aestivum*	RCAT000491	Hungary	Gyor-Sopron
615370	*aestivum* subsp. *aestivum*	RCAT000412	Hungary	Csongrad
615371	*aestivum* subsp. *aestivum*	RCAT001801	Hungary	Szolnok

PI Assignments in *Triticum* from January 2001–February 2002.

PI number	Taxon	Cultivar name or Identifcation number	Country	State/Province
615372	*aestivum* subsp. *aestivum*	RCAT003312	Hungary	Csongrad
615373	*aestivum* subsp. *aestivum*	RCAT003313	Hungary	Szabolcs-Szatmar
615374	*aestivum* subsp. *aestivum*	RCAT003334	Hungary	Bekes
615375	*aestivum* subsp. *aestivum*	RCAT003418	Hungary	Bekes
615376	*aestivum* subsp. *aestivum*	RCAT003768	Hungary	Borsod-Abauj-Zempl
615377	*aestivum* subsp. *aestivum*	RCAT003782	Hungary	Heves
615378	*aestivum* subsp. *aestivum*	RCAT003784	Hungary	Csongrad
615379	*aestivum* subsp. *aestivum*	RCAT003865	Hungary	Bekes
615380	*aestivum* subsp. *aestivum*	RCAT003874	Hungary	Szolnok
615381	*aestivum* subsp. *aestivum*	RCAT003906	Hungary	Bekes
615382	*aestivum* subsp. *aestivum*	RCAT004126	Hungary	Zala
615383	*aestivum* subsp. *aestivum*	RCAT002105	Hungary	Somogy
615384	*aestivum* subsp. *aestivum*	RCAT002116	Hungary	Pest
615385	*aestivum* subsp. *aestivum*	RCAT004129	Hungary	Nograd
615386	*aestivum* subsp. *aestivum*	RCAT004555	Hungary	Bacs-Kiskun
615387	*aestivum* subsp. *aestivum*	RCAT004556	Hungary	Nograd
615388	*aestivum* subsp. *aestivum*	RCAT004759	Hungary	Csongrad
615389	*aestivum* subsp. *aestivum*	RCAT004795	Hungary	Somogy
615390	*aestivum* subsp. *aestivum*	RCAT004797	Hungary	Fejer
615543	*aestivum* subsp. *aestivum*	Alsen	United States	North Dakota
615588	*aestivum* subsp. *aestivum*	NC99BGTAG11	United States	North Carolina
615589	*aestivum* subsp. *aestivum*	96ARS 1032	United States	Washington
615590	*aestivum* subsp. *aestivum*	96ARS 1033	United States	Washington
615591	*aestivum* subsp. *aestivum*	96ARS 1034	United States	Washington
615592	*aestivum* subsp. *aestivum*	96ARS 1035	United States	Washington
615593	*aestivum* subsp. *aestivum*	96ARS 1037	United States	Washington
615594	*aestivum* subsp. *aestivum*	96ARS 1040	United States	Washington
615595	*aestivum* subsp. *aestivum*	96ARS 1041	United States	Washington
615596	*aestivum* subsp. *aestivum*	96ARS 1042	United States	Washington
615597	*aestivum* subsp. *aestivum*	96ARS 1043	United States	Washington
615598	*aestivum* subsp. *aestivum*	96ARS 1045	United States	Washington
615599	*aestivum* subsp. *aestivum*	96ARS 1051	United States	Washington
615600	*aestivum* subsp. *aestivum*	96ARS 1052	United States	Washington
615601	*aestivum* subsp. *aestivum*	96ARS 1053	United States	Washington
615602	*aestivum* subsp. *aestivum*	96ARS 1054	United States	Washington
615603	*aestivum* subsp. *aestivum*	96ARS 1055	United States	Washington
615604	*aestivum* subsp. *aestivum*	96ARS 1058	United States	Washington
615605	*aestivum* subsp. *aestivum*	96ARS 1060	United States	Washington
615606	*aestivum* subsp. *aestivum*	96ARS 1061	United States	Washington
615607	*aestivum* subsp. *aestivum*	96ARS 1063	United States	Washington
615608	*aestivum* subsp. *aestivum*	96ARS 1065	United States	Washington
615609	*aestivum* subsp. *aestivum*	96ARS 1067	United States	Washington
615610	*aestivum* subsp. *aestivum*	96ARS 1068	United States	Washington
615611	*aestivum* subsp. *aestivum*	96ARS 1069	United States	Washington
615612	*aestivum* subsp. *aestivum*	96ARS 1070	United States	Washington
615613	*aestivum* subsp. *aestivum*	96ARS 1073	United States	Washington
615614	*aestivum* subsp. *aestivum*	96ARS 1076	United States	Washington
615615	*aestivum* subsp. *aestivum*	96ARS 1077	United States	Washington
615616	*aestivum* subsp. *aestivum*	96ARS 1078	United States	Washington
615617	*aestivum* subsp. *aestivum*	96ARS 1079	United States	Washington
615618	*aestivum* subsp. *aestivum*	96ARS 1083	United States	Washington

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PI number	Taxon	Cultivar name or Identifcation number	Country	State/Province
615619	*aestivum* subsp. *aestivum*	96ARS 1086	United States	Washington
615620	*aestivum* subsp. *aestivum*	96ARS 1087	United States	Washington
615621	*aestivum* subsp. *aestivum*	96ARS 1088	United States	Washington
615622	*aestivum* subsp. *aestivum*	96ARS 1089	United States	Washington
615623	*aestivum* subsp. *aestivum*	96ARS 1091	United States	Washington
615624	*aestivum* subsp. *aestivum*	96ARS 1094	United States	Washington
615625	*aestivum* subsp. *aestivum*	96ARS 1095	United States	Washington
615626	*aestivum* subsp. *aestivum*	96ARS 1096	United States	Washington
615627	*aestivum* subsp. *aestivum*	96ARS 1097	United States	Washington
615628	*aestivum* subsp. *aestivum*	96ARS 1099	United States	Washington
615629	*aestivum* subsp. *aestivum*	97ARS 131	United States	Washington
615630	*aestivum* subsp. *aestivum*	97ARS 140	United States	Washington
615631	*aestivum* subsp. *aestivum*	97ARS 148	United States	Washington
615632	*aestivum* subsp. *aestivum*	97ARS 149	United States	Washington
615633	*aestivum* subsp. *aestivum*	97ARS 155	United States	Washington
615634	*aestivum* subsp. *aestivum*	97ARS 135	United States	Washington
615635	*aestivum* subsp. *aestivum*	97ARS 136	United States	Washington
615636	*aestivum* subsp. *aestivum*	97ARS 138	United States	Washington
615637	*aestivum* subsp. *aestivum*	97ARS 159	United States	Washington
615638	*aestivum* subsp. *aestivum*	97ARS 160	United States	Washington
615639	*aestivum* subsp. *aestivum*	97ARS 169	United States	Washington
615640	*aestivum* subsp. *aestivum*	97ARS 170	United States	Washington
615641	*aestivum* subsp. *aestivum*	97ARS 172	United States	Washington
615642	*aestivum* subsp. *aestivum*	97ARS 178	United States	Washington
615643	*aestivum* subsp. *aestivum*	97ARS 179	United States	Washington
615644	*aestivum* subsp. *aestivum*	97ARS 165	United States	Washington
615645	*aestivum* subsp. *aestivum*	97ARS 168	United States	Washington
615646	*aestivum* subsp. *aestivum*	97ARS 181	United States	Washington
615647	*aestivum* subsp. *aestivum*	97ARS 182	United States	Washington
615648	*aestivum* subsp. *aestivum*	97ARS 192	United States	Washington
615649	*aestivum* subsp. *aestivum*	97ARS 195	United States	Washington
615650	*aestivum* subsp. *aestivum*	97ARS 196	United States	Washington
615651	*aestivum* subsp. *aestivum*	97ARS 214	United States	Washington
615652	*aestivum* subsp. *aestivum*	97ARS 216	United States	Washington
615653	*aestivum* subsp. *aestivum*	97ARS 227	United States	Washington
615654	*aestivum* subsp. *aestivum*	97ARS 199	United States	Washington
615655	*aestivum* subsp. *aestivum*	97ARS 200	United States	Washington
615656	*aestivum* subsp. *aestivum*	97ARS 202	United States	Washington
615657	*aestivum* subsp. *aestivum*	97ARS 204	United States	Washington
615658	*aestivum* subsp. *aestivum*	97ARS 205	United States	Washington
615659	*aestivum* subsp. *aestivum*	97ARS 197	United States	Washington
615660	*aestivum* subsp. *aestivum*	97ARS 198	United States	Washington
615661	*aestivum* subsp. *aestivum*	97ARS 219	United States	Washington
615662	*aestivum* subsp. *aestivum*	97ARS 225	United States	Washington
615663	*aestivum* subsp. *aestivum*	97ARS 230	United States	Washington
615664	*aestivum* subsp. *aestivum*	97ARS 209	United States	Washington
615665	*aestivum* subsp. *aestivum*	97ARS 210	United States	Washington
615666	*aestivum* subsp. *aestivum*	97ARS 211	United States	Washington
615667	*aestivum* subsp. *aestivum*	97ARS 212	United States	Washington
616491	*aestivum* subsp. *aestivum*	WQL6WTNS	United States	Washington
616492	*aestivum* subsp. *aestivum*	WQL6WTNH	United States	Washington

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PI number	Taxon	Cultivar name or Identifcation number	Country	State/Province
617032	*aestivum* subsp. *aestivum*	Lakin	United States	Kansas
617033	*aestivum* subsp. *aestivum*	Stanton	United States	Kansas
617053	*aestivum*	Sisson	United States	Virginia
617054	*aestivum*	Century II	United States	Virginia
617055	*aestivum*	USG 3209	United States	Virginia
617061	*aestivum* subsp. *aestivum*	NW97S343	United States	Nebraska
617062	*aestivum* subsp. *aestivum*	NW96S016	United States	Nebraska
617063	*aestivum* subsp. *aestivum*	NW97S154	United States	Nebraska
617064	*aestivum* subsp. *aestivum*	N95L11881	United States	Nebraska
617065	*aestivum* subsp. *aestivum*	97L9520	United States	Nebraska
617066	*aestivum* subsp. *aestivum*	97L9521	United States	Nebraska
617067	*aestivum* subsp. *aestivum*	97L9522	United States	Nebraska
617068	*aestivum* subsp. *aestivum*	97L9531	United States	Nebraska
617069	*aestivum* subsp. *aestivum*	96MD7413-58	United States	Nebraska
617070	*aestivum* subsp. *aestivum*	96MD7413-36	United States	Nebraska
617071	*aestivum* subsp. *aestivum*	96MD7110-71	United States	Nebraska
617072	*aestivum* subsp. *aestivum*	Macon	United States	Washington
617073	*aestivum* subsp. *aestivum*	Tara	United States	Washington
618588	*aestivum*	766	United States	Virginia
618611	*aestivum*	Coker 9025	United States	
618734	*aestivum* subsp. *aestivum*	Iona	United States	Idaho
619051	*aestivum*	38247	United States	Virginia
619052	*aestivum*	38158	United States	Virginia
619072	*aestivum*	Granite	Germany	
619086	*aestivum* subsp. *aestivum*	Explorer	United States	Montana
619089	*aestivum*	NuFrontier	United States	
619098	*aestivum* subsp. *aestivum*	Wahoo	United States	Nebraska
619166	*aestivum* subsp. *aestivum*	BigSky	United States	Montana
619167	*aestivum* subsp. *aestivum*	NuSky	United States	Montana
619197	*aestivum*	Mitchell	United States	
619198	*aestivum*	NuHorizon	United States	
619199	*aestivum*	Dumas	United States	
619200	*aestivum*	Charter	United States	
619231	*aestivum* subsp. *aestivum*	N96L9970	United States	Nebraska
619354	*aestivum* subsp. *aestivum*	99ID388	United States	Nebraska
619355	*aestivum* subsp. *aestivum*	99ID389	United States	Nebraska
619356	*aestivum* subsp. *aestivum*	99ID435	United States	Nebraska
619357	*aestivum* subsp. *aestivum*	99ID450	United States	Nebraska
619358	*aestivum* subsp. *aestivum*	99ID454	United States	Nebraska
619359	*aestivum* subsp. *aestivum*	99ID477	United States	Nebraska
619360	*aestivum* subsp. *aestivum*	99ID484	United States	Nebraska
619361	*aestivum* subsp. *aestivum*	99ID490	United States	Nebraska
619362	*aestivum* subsp. *aestivum*	99ID496	United States	Nebraska
619363	*aestivum* subsp. *aestivum*	99ID498	United States	Nebraska
619364	*aestivum* subsp. *aestivum*	99ID510	United States	Nebraska
619365	*aestivum* subsp. *aestivum*	99ID516	United States	Nebraska
619366	*aestivum* subsp. *aestivum*	99ID520	United States	Nebraska
619367	*aestivum* subsp. *aestivum*	99ID524	United States	Nebraska
619368	*aestivum* subsp. *aestivum*	99ID529	United States	Nebraska
619369	*aestivum* subsp. *aestivum*	99ID536	United States	Nebraska
619370	*aestivum* subsp. *aestivum*	99ID546	United States	Nebraska

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619371	*aestivum* subsp. *aestivum*	99ID548	United States	Nebraska
619372	*aestivum* subsp. *aestivum*	99ID554	United States	Nebraska
619373	*aestivum* subsp. *aestivum*	99ID569	United States	Nebraska
619374	*aestivum* subsp. *aestivum*	99ID590	United States	Nebraska
619375	*aestivum* subsp. *aestivum*	99ID594	United States	Nebraska
619376	*aestivum* subsp. *aestivum*	NWX008068	United States	Nebraska
619377	*aestivum* subsp. *aestivum*	NWX008069	United States	Nebraska
619378	*aestivum* subsp. *aestivum*	NWX008070	United States	Nebraska
619379	*aestivum* subsp. *aestivum*	NWX008075	United States	Nebraska
619380	*aestivum* subsp. *aestivum*	NWX008093	United States	Nebraska
619381	*aestivum* subsp. *aestivum*	NWX008094	United States	Nebraska
619382	*aestivum* subsp. *aestivum*	NWX008106	United States	Nebraska
619383	*aestivum* subsp. *aestivum*	NWX008109	United States	Nebraska
619384	*aestivum* subsp. *aestivum*	NWX008118	United States	Nebraska
619397	*aestivum* subsp. *aestivum*	Buck Pronto	Netherlands	
619419	*aestivum* subsp. *aestivum*	Declo	United States	
619426	*aestivum*	Keystone	United States	
619428	*aestivum*	Bonus	United States	
619608	*aestivum*	Hanna	United States	
619609	*aestivum*	Knudson	United States	
619610	*aestivum*	CDC Falcon	United States	
619611	*aestivum*	25R78	United States	
619612	*aestivum*	25R42	United States	
619613	*aestivum*	25R23	United States	
619633	*aestivum*	Nahuatl F2000	Mexico	Mexico
619634	*aestivum*	Tlaxcala F2000	Mexico	Mexico
619635	*aestivum*	Juchi F2000	Mexico	Mexico
620628	*aestivum* subsp. *aestivum*	A93324S-76kbr	United States	Idaho
620629	*aestivum* subsp. *aestivum*	IDO513	United States	Idaho
620630	*aestivum* subsp. *aestivum*	IDO517	United States	Idaho
620631	*aestivum* subsp. *aestivum*	IDO526	United States	Idaho
620632	*aestivum* subsp. *aestivum*	Gary	United States	Idaho
620633	*aestivum* subsp. *aestivum*	IDO556	United States	Idaho
620634	*aestivum* subsp. *aestivum*	IDO563	United States	Idaho
620635	*aestivum* subsp. *aestivum*	IDO569	United States	Idaho
620636	*aestivum* subsp. *aestivum*	IDO571	United States	Idaho
620637	*aestivum* subsp. *aestivum*	IDO576	United States	Idaho
620638	*aestivum* subsp. *aestivum*	IDO580	United States	Idaho
620641	*aestivum* subsp. *aestivum*	3870118	United States	Oregon
620642	*aestivum* subsp. *aestivum*	3900394	United States	Oregon
620643	*aestivum* subsp. *aestivum*	3930396	United States	Oregon
620644	*aestivum* subsp. *aestivum*	3930153	United States	Oregon
620645	*aestivum* subsp. *aestivum*	900327	United States	Oregon
620646	*aestivum* subsp. *aestivum*	889294	United States	Oregon
620647	*aestivum* subsp. *aestivum*	3930324	United States	Oregon
620648	*aestivum* subsp. *aestivum*	899210	United States	Oregon
620649	*aestivum* subsp. *aestivum*	3880045	United States	Oregon
620650	*aestivum* subsp. *aestivum*	910102	United States	Oregon
620651	*aestivum* subsp. *aestivum*	880494	United States	Oregon
620652	*aestivum* subsp. *aestivum*	3900438	United States	Oregon
620653	*aestivum* subsp. *aestivum*	3880039	United States	Oregon

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620660	*aestivum* subsp. *aestivum*	3930264	United States	Oregon
620661	*aestivum* subsp. *aestivum*	910147	United States	Oregon
620662	*aestivum* subsp. *aestivum*	908294	United States	Oregon
620663	*aestivum* subsp. *aestivum*	900438	United States	Oregon
620664	*aestivum* subsp. *aestivum*	861555	United States	Oregon
620665	*aestivum* subsp. *aestivum*	890074	United States	Oregon
620666	*aestivum* subsp. *aestivum*	3950719	United States	Oregon
620667	*aestivum* subsp. *aestivum*	3950803	United States	Oregon
620668	*aestivum* subsp. *aestivum*	3950804	United States	Oregon
620669	*aestivum* subsp. *aestivum*	3930267	United States	Oregon
620670	*aestivum* subsp. *aestivum*	3920022	United States	Oregon
620671	*aestivum* subsp. *aestivum*	3870552	United States	Oregon
620672	*aestivum* subsp. *aestivum*	3930326	United States	Oregon
620673	*aestivum* subsp. *aestivum*	3930330	United States	Oregon
620674	*aestivum* subsp. *aestivum*	908237	United States	Oregon
620675	*aestivum* subsp. *aestivum*	899407	United States	Oregon
620676	*aestivum* subsp. *aestivum*	908134	United States	Oregon
620677	*aestivum* subsp. *aestivum*	910379	United States	Oregon
620678	*aestivum* subsp. *aestivum*	2626	United States	Oregon
620679	*aestivum* subsp. *aestivum*	3870115	United States	Oregon
620680	*aestivum* subsp. *aestivum*	3870634	United States	Oregon
620681	*aestivum* subsp. *aestivum*	3930387	United States	Oregon
620682	*aestivum* subsp. *aestivum*	3930257	United States	Oregon
620683	*aestivum* subsp. *aestivum*	3950865	United States	Oregon
620684	*aestivum* subsp. *aestivum*	899302	United States	Oregon
620685	*aestivum* subsp. *aestivum*	1922	United States	Oregon
620686	*aestivum* subsp. *aestivum*	3870538	United States	Oregon
620687	*aestivum* subsp. *aestivum*	3930055	United States	Oregon
620688	*aestivum* subsp. *aestivum*	920548	United States	Oregon
620689	*aestivum* subsp. *aestivum*	3920068	United States	Oregon
620690	*aestivum* subsp. *aestivum*	900327	United States	Oregon
620691	*aestivum* subsp. *aestivum*	900192	United States	Oregon
620692	*aestivum* subsp. *aestivum*	900381	United States	Oregon
620693	*aestivum* subsp. *aestivum*	908289	United States	Oregon
620694	*aestivum* subsp. *aestivum*	908164	United States	Oregon
620695	*aestivum* subsp. *aestivum*	889303	United States	Oregon
620696	*aestivum* subsp. *aestivum*	899511	United States	Oregon
620697	*aestivum* subsp. *aestivum*	908127	United States	Oregon
620698	*aestivum* subsp. *aestivum*	910231	United States	Oregon
620699	*aestivum* subsp. *aestivum*	900031	United States	Oregon
620700	*aestivum* subsp. *aestivum*	908110	United States	Oregon
620701	*aestivum* subsp. *aestivum*	910262	United States	Oregon
620702	*aestivum* subsp. *aestivum*	3940160	United States	Oregon
620703	*aestivum* subsp. *aestivum*	3940263	United States	Oregon
620704	*aestivum* subsp. *aestivum*	3950710	United States	Oregon
620705	*aestivum* subsp. *aestivum*	3950712	United States	Oregon
620706	*aestivum* subsp. *aestivum*	3950727	United States	Oregon
620707	*aestivum* subsp. *aestivum*	3950728	United States	Oregon
620708	*aestivum* subsp. *aestivum*	3950730	United States	Oregon
620709	*aestivum* subsp. *aestivum*	3950733	United States	Oregon
620710	*aestivum* subsp. *aestivum*	3950750	United States	Oregon

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620711	*aestivum* subsp. *aestivum*	OR9630057	United States	Oregon
620712	*aestivum* subsp. *aestivum*	OR9630058	United States	Oregon
620713	*aestivum* subsp. *aestivum*	OR9630062	United States	Oregon
620714	*aestivum* subsp. *aestivum*	OR9630064	United States	Oregon
620715	*aestivum* subsp. *aestivum*	SEG951041	United States	Oregon
620716	*aestivum* subsp. *aestivum*	928132	United States	Oregon
620717	*aestivum* subsp. *aestivum*	940005	United States	Oregon
620718	*aestivum* subsp. *aestivum*	940043	United States	Oregon
620719	*aestivum* subsp. *aestivum*	940214	United States	Oregon
620720	*aestivum* subsp. *aestivum*	940228	United States	Oregon
620721	*aestivum* subsp. *aestivum*	940078	United States	Oregon
620722	*aestivum* subsp. *aestivum*	940079	United States	Oregon
620723	*aestivum* subsp. *aestivum*	940447	United States	Oregon
620724	*aestivum* subsp. *aestivum*	940099	United States	Oregon
620725	*aestivum* subsp. *aestivum*	940105	United States	Oregon
620726	*aestivum* subsp. *aestivum*	940205	United States	Oregon
620727	*aestivum* subsp. *aestivum*	940719	United States	Oregon
620728	*aestivum* subsp. *aestivum*	942732	United States	Oregon
620729	*aestivum* subsp. *aestivum*	942742	United States	Oregon
620730	*aestivum* subsp. *aestivum*	942969	United States	Oregon
620731	*aestivum* subsp. *aestivum*	943065	United States	Oregon
620732	*aestivum* subsp. *aestivum*	943075	United States	Oregon
620733	*aestivum* subsp. *aestivum*	943302	United States	Oregon
620734	*aestivum* subsp. *aestivum*	SEG95-739	United States	Oregon
620735	*aestivum* subsp. *aestivum*	SEG95-740	United States	Oregon
620736	*aestivum* subsp. *aestivum*	SEG95-740	United States	Oregon
620737	*aestivum* subsp. *aestivum*	SEG95-761	United States	Oregon
620738	*aestivum* subsp. *aestivum*	SEG95-761	United States	Oregon
620739	*aestivum* subsp. *aestivum*	SEG95-761	United States	Oregon
620740	*aestivum* subsp. *aestivum*	SEG95-767	United States	Oregon
620741	*aestivum* subsp. *aestivum*	SEG95-939	United States	Oregon
620742	*aestivum* subsp. *aestivum*	SEG95-997	United States	Oregon
620743	*aestivum* subsp. *aestivum*	SEG951007	United States	Oregon
620744	*aestivum* subsp. *aestivum*	SEG951032	United States	Oregon
620745	*aestivum* subsp. *aestivum*	SEG951036	United States	Oregon
620746	*aestivum* subsp. *aestivum*	SEG951047	United States	Oregon
620747	*aestivum* subsp. *aestivum*	SEG951104	United States	Oregon
620748	*aestivum* subsp. *aestivum*	SEG951128	United States	Oregon
620749	*aestivum* subsp. *aestivum*	908127	United States	Oregon
620750	*aestivum* subsp. *aestivum*	910227	United States	Oregon
620751	*aestivum* subsp. *aestivum*	910231	United States	Oregon
620752	*aestivum* subsp. *aestivum*	910263	United States	Oregon
620753	*aestivum* subsp. *aestivum*	920070	United States	Oregon
620754	*aestivum* subsp. *aestivum*	920450	United States	Oregon
620755	*aestivum* subsp. *aestivum*	941102	United States	Oregon
620756	*aestivum* subsp. *aestivum*	943202	United States	Oregon
620757	*aestivum* subsp. *aestivum*	940205	United States	Oregon
620758	*aestivum* subsp. *aestivum*	941379	United States	Oregon
620759	*aestivum* subsp. *aestivum*	OR9800949	United States	Oregon
620766	*aestivum* subsp. *aestivum*	Avalanche	United States	Colorado

PI Assignments in *Triticum* from January 2001–February 2002.

PI number	Taxon	Cultivar name or Identifcation number	Country	State/Province
620884	*turgidum* subsp. *durum*			
	turgidum subsp. *dicoccon*	to	Iran	
628270	*turdigum* subsp. *turanicum*			
	turgidum subsp. *turgidum*			
628343	*aestivum*	91426E39	United States	
628344	*aestivum*	901146E15	United States	
628363	*aestivum*	Eldon	United States	
628368	*turgidum* subsp. *durum*	Orita	United States	
628369	*turgidum* subsp. *durum*	Alamo	United States	
628640	*aestivum* subsp. *aestivum*	Finch	United States	Washington
628641	*aestivum* subsp. *aestivum*	Chukar	United States	Washington
628644	*aestivum* subsp. *aestivum*	UCRBW01-1	United States	California
628645	*aestivum* subsp. *aestivum*	UCRBW01-2	United States	California
628646	*aestivum* subsp. *aestivum*	UCRBW01-3	United States	California
628647	*aestivum* subsp. *aestivum*	UCRBW01-4	United States	California
628648	*aestivum* subsp. *aestivum*	UCRBW01-5	United States	California
628649	*aestivum* subsp. *aestivum*	UCRBW01-6	United States	California
628650	*aestivum* subsp. *aestivum*	UCRD01-1	United States	California
628651	*turgidum* subsp. *durum*	UCRD01-2	United States	California
628652	*turgidum* subsp. *durum*	UCRD01-3	United States	California
628653	*turgidum* subsp. *durum*	UCRD01-4	United States	California
628654	*turgidum* subsp. *durum*	UCRD01-5	United States	California
628655	*turgidum* subsp. *durum*	UCRD01-6	United States	California
628987	*aestivum* subsp. *aestivum*	Residence	Netherlands	
628988	*aestivum* subsp. *aestivum*	Semper	Netherlands	

PI Assignments in *Secale* and *X Triticosecale* from January 2001–February 2002.

PI number	Taxon	Cultivar name or Identifcation number	Country	State/Province
615331	*cereale* subsp. *cereale*	RCAT013928	Hungary	Bacs-Kiskun
615332	*sylvestre*	RCAT042415	Hungary	Pest
615333	*sylvestre*	RCAT042416	Hungary	Pest
615334	*sylvestre*	RCAT042417	Hungary	Pest
615414	*X Triticosecale sp.*	Triticale 64	Hungary	
615529	*X Triticosecale sp.*	Alzo	Poland	
618640	*cereale* subsp. *cereale*	17583	Portugal	
618641	*cereale* subsp. *cereale*	17584	Portugal	
618642	*cereale* subsp. *cereale*	17585	Portugal	
618643	*cereale* subsp. *cereale*	17592	Portugal	
618644	*cereale* subsp. *cereale*	17537	Portugal	
618645	*cereale* subsp. *cereale*	17600	Portugal	
618646	*cereale* subsp. *cereale*	17542	Portugal	
618647	*cereale* subsp. *cereale*	17545	Portugal	
618648	*cereale* subsp. *cereale*	17546	Portugal	
618649	*cereale* subsp. *cereale*	17547	Portugal	

PI Assignments in *Secale* and *X Triticosecale* from January 2001–February 2002.

PI number	Taxon	Cultivar name or Identifcation number	Country	State/Province
618650	*cereale* subsp. *cereale*	17548	Portugal	
618651	*cereale* subsp. *cereale*	17602	Portugal	
618652	*cereale* subsp. *cereale*	17603	Portugal	
618653	*cereale* subsp. *cereale*	17605	Portugal	
618654	*cereale* subsp. *cereale*	17564	Portugal	
618655	*cereale* subsp. *cereale*	17574	Portugal	
618656	*cereale* subsp. *cereale*	17683	Portugal	
618657	*cereale* subsp. *cereale*	17694	Portugal	
618658	*cereale* subsp. *cereale*	17695	Portugal	
618659	*cereale* subsp. *cereale*	17697	Portugal	
618660	*cereale* subsp. *cereale*	Kuckucks Riesengebirg	Germany	
618661	*cereale* subsp. *cereale*	Osterreich	Austria	
618662	*cereale* subsp. *afghanicum*	30225	Armenia	
618663	*cereale* subsp. *ancestrale*	14357	Turkey	
618664	*cereale* subsp. *ancestrale*	17791	Sweden	
618665	*cereale* subsp. *ancestrale*	24263	Poland	
618666	*cereale* subsp. *ancestrale*	30226	Turkey	
618667	*cereale* subsp. *dighoricum*	17785	Sweden	
618668	*cereale* subsp. *dighoricum*	30224	Russian Federation	
618669	*cereale* subsp. *rigidum*	14193	Turkey	
618670	*cereale* subsp. *segetale*	7520	Azerbaijan	
618671	*cereale* subsp. *segetale*	14372	Turkey	
618672	*cereale* subsp. *segetale*	24269	Poland	
618673	*cereale* subsp. *segetale*	1782/94	Turkey	
618674	*sylvestre*	838/96	Ukraine	
618675	*sylvestre*	839/96	Bulgaria	
618676	*sylvestre*	14185	Poland	
618677	*sylvestre*	30227	Ukraine	
618678	*vavilovii*	30228	Armenia	
618678	*vavilovii*	833/96	Georgia	
618678	*vavilovii*	1783/94	Turkey	
618678	*vavilovii*	1784/94	Turkey	
618678	*vavilovii*	14197	Poland	
619184	*cereale* subsp. *segetale*	SD 83-3	United States	South Dakota
620762	*X Triticosecale sp.*	TCLF-AN-31	Mexico	Coahuila
620763	*X Triticosecale sp.*	TCLF-AN-34	Mexico	Coahuila
628642	*cereale* subsp. *cereale*	UCRR1-2001	United States	California
628643	*cereale* subsp. *cereale*	UCRR2-2001	United States	California
628656	*X Triticosecale sp.*	UCRTCL1-2001	United States	California
628657	*X Triticosecale sp.*	UCRTCL2-2001	United States	California
628658	*X Triticosecale sp.*	UCRTCL3-2001	United States	California

V. CATALOGUE OF GENE SYMBOLS FOR WHEAT: 2002 SUPPLEMENT

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Revisions.

10. Laboratory Designators for DNA markers

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Gross Morphology : Spike Characteristics
5. Elongated glume

P1. Revise:
P1. [*P* {911}; *Eg* {922}; *P–A^{pol}1* {0254}; *P-A^{pet}1* {0254}]. 7AL {922, 1547}, 7A, or 7B (based on linkage of 0.2 with a gene for red coleoptile {922}.
i: Saratovskaya 29*8//Novsibirskaya 67*2/*T. polonicum* {922}.
itv: P-LD222 = LD222*11/*T. turgidum* var *polonicum* {1546,1547}.
tv: *T. polonicum* {0254}; *T. petropavlovskyi* {0254}.
ma: *Xgwm260-7A* (S) – 2.3 cM – *P1* – 5.6 cM – *Xgwm1083-7A* (L) {0254};
Xgwm890-7A – 2.1 cM – *P1* {0254}.
Add at the end of the 'Elongated glume' section:
Note: The loci determining elongated glumes in the *T. turanicum* and *T. durum* conv. *falcatum* are not homoeologous to the *P* loci in the centromeric region of the group-7 chromosomes {0254}.

Alkylresocinols Content in Grain
Ar1. {0250} 5AL {0281}. High alkylresocinols content is dominant {0281}.
tv: Langdon {0281}.
ar1 {0281}. **tv:** Ardente {0281}. This cultivar has a low content compared to all tested durum and common wheats {0281}

Aluminium Tolerance
Alt2. **ma:** Add: '*Alt2* cosegregated with *Xbcd1230-4D* and fell within the interval *Xgdm125-4D* – 4.8 cM – *Alt2* – 1.1 cM – *Xpsr914-4D* {0248}.'.

Anthocyanin Pigmentation
3. Red/purple coleoptiles
Replace the previous entries with:
There is an orthologous gene series on the short arms of homoeologous group 7. The 'a' alleles confer red coleoptiles.

Rc-A1a {0250}.	[*Rc1*, *R* {401}].	7A {769,1293}, 7AS {0250}.	**s:** CS*6/Hope 7A {1293}.
	v: Hope *Rc-B1*		
	ma: *Rc-A1* (distal) – 11.9 cM – *Xgwm913-7A* {0250}.		
Rc-B1a {0250}.	[*Rc2, R2* {401}].	7B {742}, 7BS {401, 769, 0250}	**s:** CS*6/Hope 7B {769}.
	v: Hope *Rc-A1*.		
	ma: *Xgwm263-7B* – 26.1 cM – *Rc-B1* – 11.0 cM – *Xgwm1184* {0250}.		
Rc-D1a {0250}.	[*Rc3*].	7D {596}, 7DS {1241, 1444, 0250}.	
	v: Mironovskaya 808 {1444}; Tetra Canthatch/*Ae. squarrosa* var. *strangulata* RL 5271, RL 5404 {1240}; Tetra Canthatch/*Ae. squarrosa* var. *meyeri* RL 5289, RL 5406 {1240}; Sears' *T. dicoccoides/Ae. squarrosa* = Sears' Synthetic {596}.		
	ma: *Rc-D1* (distal) – 3 cM – *Xpsr108-7D* {180}; *Xgwm44-7D* – 6.4 cM – *Rc-D1* – 13.7 cM – *Xgwm111-7D* {0250}.		

Tahir & Tsunewaki {1453} reported that *T. spelta* var. *duhamelianum* carries genes promoting pigmentation on chromosomes 7A and 7D and genes suppressing pigmentation on 2A, 2B, 2D, 3B, and 6A. Sutka {1444} reported a fourth factor in chromosome 6B and suppressors in 2A, 2B, 2D, 4B, and 6A.

Awnedness
1. Dominant Inhibitors
1.2. Tipped 1
B1 Revise '5AL {1293}.' to '5AL {1293,0242}.'.

DNA Markers
Group 1S
Amendments:
Xabg500-1A. Revise the first column to '*Xabg500-1A* {280}[5], *1B,D* {0252}[1].'.
Xbcd446-1A. Add '(1BL).' in the last column.
Xbcd1124-1A,B. Revise the first column to '*Xbcd1124-1A* {280}[5], *1B* {1529}[1], *1D* {0252}[1].'.
Xbcd1706-1A,B. Revise the first column to '*Xbcd1796-1A* {280}[5], *1B* {1529}[1], *1D* {0252}[1].'.
Xcdo99-1B,D. Revise the first column to '*Xcdo99-1A* {0252}[1], *1B* {154}[1], *1D* {1529}[4].'.
Xcdo388-1B,D. Revise the first column to '*Xcdo388-1B.1* [{1529,0252}][1], *1D* {1529}[4].', add '[*Xcdo388-1B* {1529}, *Xcdo388a-1B* {0252}].' in the second column, and revise the last column to '(1BL, 2B, 3D, 4A,D, 5A,B, A,D).'.
Xcdo534-1B. Revise the last column to '(3A, 6A,B,D, 7A).'.
Xcdo580-1A. Revise the first column to '*Xcdo580-1A* {280}[1,3,5],{1529}[1], *1D* {0242}.
Xcdo658-1A,B,D. Revise the first column to '*Xcdo658-1A* {280}[3,5],{0252}[1], *1B,D* {445}[1].'.
Xcdo1173-1A,B,D. Revise the first column to '*Xcdo1173-1A* {280}[3,5],{0252}[1], *1B* {1529}[1],*1D* {445}[1].'.
Xcdo1188-1A.1,B.1,D. Revise the first column to '*Xcdo1188-1A.1* [{280}][3,5],[{0252}][1], *1B.1* [{1529}][1], *1D* {445}[1].', add '[*Xcdo1188-1A.*{280}[3,5],{0252}[1], *1B* {1529}[1]].' in the second column, and add '(1AL,BL).' in the last column.
Xcdo1340-1B. Revise the first column to '*Xcdo1340-1A* {0252}, *1B* {1529}, *1D* {0252}.' and add '(1BL).' to the last column.
Xcmwg645-1A.2. Revise the first column to '*Xcmwg645-1A.1* {280}[3,5],[{0252}][1], *1B.1, D.1* [{0252}][1].' and add '[*Xcmwg645a-1A,B,D* {0252}[1]].' in the second column.
Xgwm18-1B. Add '(4B).' in the last column.
Xgwm33-1A. Revise the first column to '*Xgwm33-1A* {1226}[1], *1B* {0270}[2].' and add '(1BL).' in the last column.
Xgwm136-1A. Revise the first column to '*Xgwm136-1A* {9929},{0269}[2].'.
Xgwm273-1B. Revise the first column to '*Xgwm273-1B* {9929},{0270}[2].'.
Xgwm413-1B. Revise the first column to '*Xgwm413-1B* {9929},{0270}[2].'.
XksuE19-1A,B,D. Revise the last column to '(6D, 7B).'.
XksuF43-1B.1,.2. Revise the first column to '*XksuF43-1A* {252}, *1B.1,.2* {1529}, *1D* {0252}.'.
Xmwg60-1A. Revise the first column to '*Xmwg60-1A* {280}[1,5], *1B,D* {0250}[1].'.
Xmwg68-1A,B. Revise the first column to '*Xmwg68-1A* {280}[5],{0252}[1], *1B* {1529}[1], *1D* {0252}.'.

Xmwg837-1B.1,D. Revise the first column to '*Xmwg837-1A* [{0252}], *1B.1,D* {1529}.' and add '[*Xmwg837a-1A* {0252}].' in the second column.

Xmwg938-1B,D. Revise the first column to '*Xmwg938-1A* [{0252}], *1B.1* [{1529, 0252}], *1D* {1529}.', add '[*Xmwg938a-1A,B* {0252}, *Xmwg938-1B* {1529}].' in the second column, and revise the last column to '(1BL, 7A).'

Xmwg2021-1A.2,.2. Revise the first column to '*Xmwg2021-1A.1* {280}[3,5], *1A.2* {280}[1], *1B.1,D* [{0252}].', add '[*Xmwg2021a-1B,D* {0252}].' in the second column, and revise the last column to '(1BL, 2A, 3A).'.

Xmwg2048-1A. Revise the first column to '*Xmwg2048-1A* {282}[3],{0252}[1], *1B,D* {0252}[1].'.

Xmwg2083-1A. Revise the first column to '*Xmwg2083-1A* {280}[5], [{0250}][1], *1B.1,D* [{0252}][1].', add '[*Xmwg2083a-1B,D* {0252}].' in the second column, and add '(1BL).' in the last column.

Xmwg2245-1D. Revise the first column to '*Xmwg2245-1A,B* {0252}, *1D* {0135}.'.

Xpsr596-1A,B,D. Add '(2B, 3A).' in the last column.

Xrz244-1A. Revise the first column to '*Xrz244-1A* {1529}, *1B,D* {0252}.'.

Xsfr2(Lrk10)-1A. Revise the first column to '*Xsfr2(Lrk10)-1A* [{356, 0252}], *1B,D* [{0252}].' and revise the second column to '[*Lrk10* {356}, *XLrk10-1A,B,D* {0252}].'.

Xutv1391-1: Revise the first column to '*Xutv1391-1A* {9959}[2], *1B* {0269}[2].'

Add:

Xabg53-1A,B,D {0252}.		ABG53.	
Xabg59-1B,D {0252}.		ABG59.	
Xabg74-1A,B,D {0252}.		ABG74.	
Xabg494-1A,B,D {0252}.		ABG494.	
Xbcd368-1A {0242}.		BCD368.	
Xbcd371-1B {0275}.		BCD371.	
Xbcd762-1A.2,B.2,D [{0252}].			
	[*Xbcd762a-1A,B,D* {0252}].	BCD762.	(1AL,BL)
Xbcd1340-1A,B,D {0252}.		BCD1340.	
Xcdo127-1A,B.1,D [{0252}].			
	[*Xcdo127a-1A,B,D* {0252}].	CDO127.	(1B, 3A).
Xcdo127-1B.2 [{0252}].	[*Xcdo127b-1B* {0252}].	CDO127.	(1A,B,D, 3A).
Xcdo580-1A,B.1,D [{0252}].			
	[*Xcdo580a-1A,B,D* {0252}].	CDO580.	(1B).
Xcdo580-1B.2 [{0252}].	[*Xcdo580b-1B* {0252}].	CDO580.	(1A,B,D).
Xcdo618-1B {0269}[2].		CDO618.	(1A,B,D).
Xcdo1373-1B {0269}[2].		CDO1373.	(1BL).
Xcdo1423-1A,B,D {0252}.		CDO1423.	
Xmwg835-1A,B.1,D [{0252}].			
	[*Xmwg835a-1A,B,D* {0252}.	MWG835.	(1BL, 2A, 5A).
Xmwg913-1B.1 [{0252}].	[*Xmwg913a-1B* {0252}].	MWG913.	(1BS).
Xmwg913-1B.2 [{0252}].	[*Xmwg913b-1B* {0252}].	MWG913.	(1BS).
Xmwg2056-1A,B,D [{0252}].			
	[*Xmwg2056a-1A,B,D* {0252}].	MWG2056.	(1BL).
Xmwg2148-1A,B.1,D [{0252}].			
	[*Xmwg2148a-1A,B,D* {0252}].	MWG2148.	(1BL).
Xmwg2197-1A,B {0252}.		MWG2197.	
Xsun18-1B {0256}.		SUN 18F/SUN18R.	
Xuaz299-1B {0269}[2].		UAZ299.	
Xutv1366-1A.1 {0269}.[2]	[*Xutv1366d-1A* {0269}[2]].	UTV1366.	
Xutv1366-1A.2 {0269}[2].	[*Xutv1366c-1A* {0269}[2]].	UTV1366.	
Xwmc24-1A [{0242}].	[*Xwmc024-1A* {0242}].	WMC 24F/WMC 24R.	(2A).
Xwmc147-1D {0242}.		WMC 147F/WMC 147R.	
Xwmc336-1D {0242}.		WMC 336F/WMC 336R.	
Xwmc432-1D {0242}.		WMC 432F/WMC 432R.	

Group 1L

Amendments:

Xabc151. Revise the first column to ‘*Xabc151-1B* {0252}[1], *1D* {1529}[4].’.

Xabg452. Revise the first column to ‘*Xabg452-1A* {1529}[1],{280}[1,3,5], *1B,D* {0252}[1].’.

Xbcd22-1A. Revise the first column to ‘*Xbcd22-1A* {280}[5], *1B* {0242, 0252}[1], *1D* {0252}[1].’ and revise the last column to ‘(3A,D)’.

Xbcd207-1A. Revise the first column to ‘*Xbcd207-1A* {280}[5], *1B* {0274}[1].’

Xbcd310-1B. Revise the first column to ‘*Xbcd310-1A* {0242}, *1B* {445}.’.

Xbcd265-1A,B,D. Revise the last column to ‘(2B, 4B,D, 5A).’.

Xbcd762-1A,B. Revise the first column to ‘*Xbcd762-1A.1* [{280}][5], *1B.1* [{1529,0252}][1].’, add ‘[*Xbcd762-1A* {280}[5], *Xbcd762-1B* {1529}[1], *Xbcd762b-1B* {0252}[1]].’ in the second column, and add ‘(1AS,BS,DS).’ in the last column.

Xbcd808-1A.1, *.2*. Revise the first column to ‘*Xbcd808-1A.1* {1529}[1],{280}[1,3,5], *1A.2* {1529}, *1B* {0242}.’.

Xbcd921-1A,D. Revise the first column to ‘*Xbcd921-1A* {280}[5], *1B* {0252}[1], *1D* {445}[1].’

Xcdo105-1A. Revise the first column to ‘*Xcdo105-1A* {280}[1,5], *1B* {0275}[1].’.

Xcdo393-1A,B. Revise the first column to ‘*Xcdo393-1A* {1529}[1], {280}[3], *1B* {154}, *1D* {0242}.’.

Xcdo346-1B. Revise the last column to ‘(2B, 5D).’.

Xcdo473-1A. Revise the first column to ‘*Xcdo473-1A* {1529}, *1B* {0242}.’.

Xcdo1160-1A. Revise the first column to ‘*Xcdo1160-1A* {1529}, *1B* {0275}.’.

Xcdo1396-1A. Revise the first column to ‘*Xcdo1396-1A* {280}[5], *1B* {0275}[1].’.

Xcmwg645-1A.2. Revise the first column to ‘*Xcmwg645-1A.2* {280}[5], *1B.2* [{1529,0250}][1].’, add [*Xmwg645* {280,1529}, *Xcmwg645b-1B* {0252}].’ in the second column, and revise the last column to ‘(1AS,BS,DS, 5A).’.

Xcmwg758-1A,B. Revise the first column to ‘*Xcmwg758-1A* {280}[1,3,5], *1B* {1529}[1], *1D* {0252}.’.

Xgwm124-1B. Revise the first column to ‘*Xgwm124-1B* {9929}[1], {0270}[2].’.

Xgwm153-1B. Revise the first column to ‘*Xgwm153-1B* {9929}[1], {0270}[2].’.

Xgwm268-1B. Revise the first column to ‘*Xgwm268-1B* {9929}[1], {0270}[2].’.

Xgwm403-1B. Revise the first column to ‘*Xgwm403-1B* {9929}[1], {0270}[2].’.

Xgwm498-1B. Revise the first column to ‘*Xgwm498-1B* {9929}, {0270}[2].’.

XksuA1-1B. Revise the last column to ‘(2D, 3B, 5B, 7D).’.

XksuD49-1B,D. Revise the first column to ‘*XksuD49-1A* {0242}, *1B* {728}, *1D* {448}[1,4], {1529}[1].’.

Xmwg837-1B.2. Add ‘(1AS,BS,DS).’ in the last column.

Xwg180-1A. Revise the last column to ‘(4B, 7BS,L).’.

Add:

Xbcd372-1B,D {0252}.		BCD372.	(3A,D).
Xbcd402-1D {0242}.		BCD402.	(4A, 5A,4B,D).
Xbcd446-1B {0275}.		BCD446.	(1AS).
Xbcd1495-1B {0269}[2].		BCD1495.	(6B).
Xcdo388-1B.2 [{0252}].	[*Xcdo388b-1B* {0252}].	CDO388.	(1BS,DS, 2B, 3D, 4A,D, 5A,B, 6A,D).
Xcdo583-1B [{0242}].	[*Xcdo583a-1B* {0242}].	CDO583	(3B).
Xcdo1340-1B {0269}[2].		CDO1340.	(1AS,BS,DS).
Xcdo1373-1B {0269}[2].		CDO1373.	(1BS).
Xmwg539-1A,B,D {0252}.		MWG539.	(7D).
Xmwg584-1A,B,D {0252}.		MWG584.	(3A, $4A^m$, 5D).
Xmwg835-1B.2 [{0252}].	[*Xmwg835b-1B* {0252}].	MWG835.	(1AS,BS,DS, 2A, 5A).
Xmwg896-1A,B,D {0252}.		MWG896.	
Xmwg938-1B.2 [{0252}].	[*Xmwg938b-1B* {0252}].	MWG938.	(1AS,BS,DS, 7A).
Xmwg2021-1B.2 [{0252}].	[*Xmwg2021b-1B* {0252}].	MWG2021.	(1AS,BS,DS, 2A, 3A).
Xmwg2056-1B.2 [{0252}].	[*Xmwg2056b-1B* {0252}].	MWG2056.	(1AS,BS,DS).
Xmwg2083-1B.2 [{0252}].	[*Xmwg2083b-1B* {0252}].	MWG2083.	(1AS,BS,DS).
Xmwg2148-1B.2 [{0252}].	[*Xmwg2148b-1B* {0252}].	MWG2148.	(1AS,BS,DS, 1BL).
Xmwg2148-1B.3 [{0252}].	[*Xmwg2148c-1B* {0252}].	MWG2148.	(1AS,BS,DS, 1BL)
Xpsr305-1B {0242}.		PSR305.	(3A,B,D).
Xuaz243-1B {0269}[2].		UAZ243.	
Xutv135-1A {0269}[2].		UTV135.	(3BS, 4B).

Xutv1441-1A {0269}[2].		UTV1441.	(3BL, 4B).
Xwmc304-1A {0242}.		WMC 304F/WMC 304R.	
Xwmc312-1A {0242}.		WMC 312F/WMC 312R.	
Xwmc373-1B [{0242}].	[*Xwmc373-1-1B* {0242}].	WMC 373F/WMC 373R.	
Xwmc429-1D {0242}.		WMC 429F/WMC 429R.	

Group 1

Amendments:

Xcmwg758-1D. Revise the last column to '(1AL,BL,DL).'.

Xwg232-1A. Revise the last column to '(4A,B, 5A,B,D, 6B, 7A,B).'.

Xwpg501(Pdi)-1B. Add reference 0263 in the first column, i.e. '{0064,0263}'.

Add:

Xbcd175-1A {0242}.		BCD175.	
Xbcd1072-1A,*B*,*D* {0252}.		BCD1072.	
Xsun19-1B {0156}.		SUN 19F/SUN 19R.	
Xwmc84-1A [{0242}].	[*Xwmc084-1A* {0242}].	WMC 84F/WMC 84R.	
Xwmc406-1B {0242}.		WMC 406F/WMC 406R.	

Group 2S

Amendments:

Xabg378-2A. Revise the last column to '(6A,D, 7A,4A).'.

Xbcd152-2A,*B*. Add '(6B).' to the last column.

Xbcd348-2A.1,*.2*,*B*,*D*. Add '(4A).' to the last column.

Xbcd718-2A,*D*. Revise the first column to '*Xbcd718-2A* {1060}[1], *2B* {0269}[2], *1D* {1060}[1]. '.

Xcdo1090-2A. Revise the first column to '*Xcdo1090-2A* {1060}, *2B* {0269}[2].'.

Xfba38-2D. Revise the first column to '*Xfba38-2B* {0242}, *2D* {1060}.'.†

Xfbb185-2B. Revise the last column to '(3B, 6B).'.

Xfba349-2D. Add '(7A).' to the last column.

Xgwm129-2B. Revise the last column to '(4D, 5A).'.

Xpsr801(Rbcs)-2A,*B*,*D*. To the note added to this listing in the 2001 Supplement add the reference 0271, i.e. '{0149, 0271}'.

Add:

Xbcd175-2D {0242}.		BCD175.	
Xbcd221-2B {0269}[2].		BCD221.	(4B, 6B).
Xcnl9(Pdc)-2B [{0269}][2].	[*Pdc-2B* {0269}[2]].	Pdc.	
Xpsr596-2B {0242}.		PSR596.	(1A,B,D, 3A).
Xsun17-2D {0256}.		SUN 17F/SUN 17R.	
Xwmc25-2B [{0242}].	[*Xwmc025.2-2B* {0242}].	WMC 25F/WMC 25R.	(2D).
Xwmc111-2D {0242}.		WMC 111F/WMC 111R.	
Xwmc112-2D {0242}.		WMC 112F/WMC 112R.	
Xwmc154-2B {0242}.		WMC 154F/WMC 154R.	
Xwmc314-2B {0242}.		WMC 314F/WMC 314R.	

Group 2L

Amendments:

Xabc451-2A. Revise the first column to '*Xabc451-2A* {282}[3], *2B* [{0242}], *2D* {0242}.' and add '[*Xabc451a-2B* {0242}].' in the second column.†

Xbcd135-2B,D. Add '(4A, 5D).' in the last column.

Xbcd266-2D. Revise the first column to '*Xbcd266-2A* {0242}, *2B* {0164}, *2D* {864}.'.

Xbcd292-2A,*D*. Revise the first column to '*Xbcd292-2A* {1060}`, *2B* {0242}[1],{0269}[2], *2D* {864}[1].'.

Xbcd410-2A,D. Revise the first column to '*Xbcd410-2A* {1060}, *2B* [{0242}], *2D* {1060}.' and add '[*Xbcd410d-2B* {0242}].' in the second column.
Xgwm526-2B. Add '(2A).' in the last column.
XksuF43-2D. Revise the last column to '(1A,B,D, 4D, 5D, 6D).'.
Xmwg835-2A. Revise the last column to '(1A,B,D, 5A).'.
Xmwg950-2B. Revise the first column to '*Xmwg950-2B* {1060}, *2D* {0242}.'.
Xmwg2021-2A. Revise the last column to '(1A,B,D, 3A).'.
Xutv861-2B. Revise the first column to '*Xutv861-2A* {0269}[2], *2B* {9959}[2].'.
Xwg184-2D. Revise the last column to '(3D, 4D, 5A).'.

Add:

Xabc165-2D.2 [{0242}].	[*Xabc165b-2D* {0242}]	ABC165.	(2D).
Xbcd265-2B [{0242}].	[*Xbcd265c-2B* {0242}].	BCD265.	(1A,B,D, 4B,D, 5A).
Xbcd512-2B {0242}.		BCD512.	
Xcdo346-2A {0269}[2].		CDO346.	(1B, 5D).
Xcdo365-2B {0269}[2].		CDO365.	(6B).
Xcdo669-2B [{0242}].	[*Xcdo669a-2B* {0242}].	CDO669.	(4A,B,D, 7A).
Xgwm526-2A [{0253}].	[*Xgwm526-2A.2* {0253}].	WMS F526/WMS R526.	(2B).
Xisc14(Cor)-2A [{0246}][3].	[*Cor14b* {0246}].	COR14b.	
XksuA1-2D [{0242}].	[*XksuA1b-2D* {0242}].	pTtksuA1.	(1B, 3B, 5B, 7D).
XksuF37-2B {0242}.		pTtksuF37.	(6A,B,D).
Xksu931(Chi4)-2D [{0266}][4].	[*Xksu931(Cht4)* {0266}].	SM383.	
Xksu932(Chi7)-2D [{0266}][4].	[*Xksu932(Cht7)* {0266}].	SM194.	
Xpsp3045-2A {0253}.		PSP3045F/PSP3045R.	(5B, 7D).
Xpsr370-2B,D [{0242}].	[*Xpsr370b-2B*, *Xpsr370a-2D* {0242}].	PSR370.	(5A,B,D).
Xsun11-2B {0256},[{0242}].	[*Xsunm11-2B* {0242}].	SUN 11F/SUN 11R.	
Xsun21-2B {0256}.		SUN 21F/SUN 21R.	
Xsun22-2B {0256}.		SUN 22F/SUN 22R.	
Xwmc339-2B {0242}.		WMC 339F/WMC 339R.	
Xwmc360-2B {0242}.		WMC 360F/WMC 360R.	

Group 2

Amendments:
Xabg356-2D. Revise the first column to '*Xabg356-2B* {0242}, *2D* {9926}[4].'.
Xwmc24-2A. Add '(1A).' in the last column.
Xwmc25-2D. Add '(2B).' in the last column.
Xwmc149-2B. Add '(5B).' in the last column.

Add:

Xabc162-2A {0242}.		ABC162.	
Xabc165-2D.1 [{0242}].	[*Xabc165a-2D* {0242}].	ABC165.	(2DL).
Xcdo366-2B,D {0242}.		CDO366.	
Xcdo665-2A {0242}.		CDO665.	(4A).
Xgwm271-2B [{0242}].	[*Xgwm271a-2B* {0242}].	WMS F271/WMS R271.	(5B, 5D).
XksuE7-2B {0242}.		pTtksuE7	(7D).
Xstm773-2B {0242}.		STM 773F/STM 773R.	
Xwmc18-2D [{0242}].	[*Xwmc018-2D* {0242}].	WMC 18F/WMC 18R.	
Xwmc35-2B [{0242}].	[*Xwmc035a-2B* {0242}].	WMC 35F/WMC 35R.	(4B).
Xwmc190-2D {0242}.		WMC 190F/WMC 190R.	
Xwmc198-2A {0242}.		WMC 198F/WMC 198R.	
Xwmc445-2B {0242}.		WMC 445F/WMC 445R.	

Group 3S

Amendments:

Xabg471-3A,B. Add '(6B).' to the last column.
Xcdo395-3A,D. Revise the first column to '*Xcdo395-3A* {1061}[1], *3B* {0242}[1], *3D* {9926}[4].'.
Xfbb185-3B. Revise the last column to '(2B, 6B).'.
Xgwm369-3A. Revise the first column to '*Xgwm369-3A* {9929}[1],{0269}[2].'.
Xgwm389-3B. Revise the first column to '*Xgwm389-3B* {9929}[1],{0269}[2].'.
XksuA1-3B. Revise the last column to '(1B, 2D, 5B, 7D).'.
XksuB8-3D. Revise the first column to '*XksuB8-3A,B* {0242}, *3D* {448}.'.†
Xmwg584-3A. Revise the last column to '(1A,B,D, $4A^m$, 5D).'.
Xmwg2021-3A. Revise the last column to '(1A,B,D, 2A).'.
Xpsr305-3A,B,D. Add '(1B).' to the last column.
Xsfr2(Lrk10)-3B,D. Revise the last column to '(1A,B,D).'.

Add:

Xpsr311-3A {0242}.		PSR311.	(7A,B,D).
Xutv135-3B {0269}[2].		UTV135.	(1A, 4B).
Xwmc11-3A [{0242}].	[*Xwmc011-3A* {0242}].	WMC 11F/WMC 11R.	
Xwmc43-3B [{0242}].	[*Xwmc043-3B* {0242}].	WMC 43F/WMC 43R.	

Group 3L

Amendments:

Xbcd115-3A,D. Revise the first column to '*Xbcd115-3A* {1061}, *3B* {0269}[2], *3D* [{862}].
Xbcd22-3D. Revise the first column to '*Xbcd22-3A* {0242}, *3D* {1061}.' and revise the last column to '(1A,B,D).'.
Xbcd195-3B. Revise the first column to '*Xbcd195-3A* {0269}[2], *3B* {0078}[1].'.
Xbcd372-3A,D. Add '(1B,D).' to the last column.
Xbcd451-3A,D. Revise the first column to '*Xbcd451-3A* {1061}, *3B* {0242}, *3D* [{862}].'.
Xcdo105-3B. Revise the last column to '(1A,B).'.
Xcdo482-3A,D. Revise the first column to '*Xcdo482-3A* {1061},*3B* {0242}, *3D* {862}.'.
Xcdo583-3B. Add '(1B).' to the last column.
Xcdo718-3B. Revise the first column to '*Xcdo718-3A* {0242}, *3B* {1061}.'.
Xfba175-3A. Add '(6B).' in the last column.
Xgwm155-3A. Revise the first column to '*Xgwm155-3A* {9929}[1],{0269}[2].'.
Xgwm299-3B. Revise the first column to '*Xgwm299-3B* {9929}[1],{0269}[2].'.
XksuG59-3A,D. Revise the first column to '*XksuG59-3A* {282}[3], *3B* {0242}[1], *3D* {448}[4], {1061}[1].'.
Xutv416-3A. Revise the first column to '*Xutv416-3A* {9959}[2], *3B* {0269}[2].'.
Xutv560-3A. Revise the first column to '*Xutv560-3A* {9959}[2], *3B.1,.2* [{0269}][2].' and add '[*Xutv560a,b-3B* {0269}].' in the second column.

Add:

Xabg75-3B {0242}.		ABG75.	
Xbcd941-3A {0175}.		BCD941.	
Xcdo534-3A {0269}[2].		CDO534.	(1B, 6A,B,D, 7A).
Xksu933(Glb3)-3B,D {0266}.		SM289.	
Xksu934(Glb3)-3D {0266}.		SM638.	
Xmwg2153-3A {0269}[2].		MWG2153.	
Xpsr596-3A,B [{0242}].	[*Xpsr596b-3A*, *Xpsr596a-3B* {0242}].	PSR596.	(1A,B,D, 2B).
Xpsr604-3B [{0242}].	[*Xpsr604-3B* {0242}].	PSR604.	(7A,4A,7D).
Xsun23-3A {0256}.		SUN 23F/SUN 23R.	
Xucg2(Acc-2)-3A,B,D [{0265}].	[*Xucg2-3A,B,D* {0265}].	UCG2.	(5D).
Xutv601-3A {0269}[2].		UTV601.	
Xutv920-3A {0269}[2].		UTV920.	
Xutv1151-3A {0269}[2].		UTV1151.	(6A).
Xutv1371-3B {0269}[2].		UTV1371.	(1AL, 4B).

Xutv1441-3B {0269}[2].		UTV1441.	
Xutv1474-3A {0269}[2].		UTV1474.	
Xwmc169-3A {153,0238}.		WMC 169F/WMC 169R.	
Xwmc236-3B {0242}.		WMC 236F/WMC 236R.	
Xwmc334-3B {0242}.		WMC 334F/WMC 334R.	
Xwmc428-3A {0242}.		WMC 428F/WMC 428R.	

Group 3

Amendments:
Xwg184-3D. Revise the last column to '(2D, 4D, 5A).'.
Xwmc169-3A. Delete (moved to 3L).

Add:

Xwmc50-3A [{0242}].	[*Xwmc050-3A* {0242}].	WMC 50F/WMC 50R.	
Xwmc375-3D {0242}.		WMC 375F/WMC 375R.	
Xwmc379-3A {0238}.		WMC 379F/WMC 379R.	

Group 4S (4AL:4BS:4DS)

Amendments:
Xbcd265-4B,D. Revise the last column to '(1A,B,D, 2B, 5A).'.
Xbcd583-4A. Revise the last column to '(1A,B).'.
Xbcd402-4A. Revise the last column to '(1D, 5A,4B,D).'.
Xcdo669-4A,B,D. Add '(2B, $4A^{m}$).' in the last column.
Xcdo795-4B. Revise the first column to '*Xcdo795-4A* {0242}, *4B* {1059}.'.
Xgwm18-4B. Add '(1B).' in the last column.
Xwg184-4D. Revise the last column to '(2D, 3D, 5A).'.

Add:

Xcdo949-4B {0269}[2].		CDO949.	(4DL).
Xcn110(Lpx-B1)-4B [{0269}][2].			
	[Loxmjt].	LOXMJT.	
Xfba363-4B {0242}.		FBA363.	(7A).
Xutv434.1-4A.1,.2 [{0269}][2].[*Xutv434a,b-4A* {0269}[2]].		UTV434.	(4A).
Xwg232-4B {0269}[2].		WG232.	(1A, 4A, 5A,B,D, 6B, 7A,B).
Xwmc141-4B {0242}.		WMC 141F/WMC 141R.	

$4A^{m}S$

Amendments:
Xcdo66-4A. Revise the last column to '(2B, 4A,B,D).'.
Xmwg584-4A.1. Revise the last column to (1A,B,D, 3A, $4A^{m}L$, 5D).'.
Xwg622-4A. Revise the last column to '(4AL,BS,DS, 6A).'.

Group 4L (4AS:4BL:4DL)

Amendments:
Xcdo1395-4B. Revise the first column to '*Xcdo1395-4B* {1008}, *4D* {0248}.'.
Xwg622-4A,B,D. Add '(6A).' in the last column.

Add:

Xbcd1230-4D {0248}.		BCD1230.	

$4A^{m}L$

Amendments:

Xabg463-4A. Revise the last column to '(4D, 5A, 5B).

Xmwg584-4A.2. Revise the last column to '(1A,B,D, 3A, $4A^{m}S$, 5D).

Group 5AL:4BL:4DL

Amendments:

Xbcd402-5A,4B,D. Revise the last column to '(1D, 4A).'.

Xcdo949-4D. Add '(7B).' in the last column.

Xutv434-4A.1. Revise the last column to '(4AS, 4AL).'.

Group 4

Amendments:

Xabg397-4D. Add '(5A).' in the last column.

Xabg463-4D. Revise the last column to '(4A, 5B, 5D).'.

XksuF43-4D.1. Revise the last column to '(1AB,D, 2D, 4D, 5D, 6D).'.

XksuF43-4D.2. Revise the last column to '(1A,B,D, 2D, 4D, 5D, 6D).'.

Xwg232-4A. Revise the last column to '(1A, 4B, 5A,B,D, 6B, 7A,B).'.

Xwmc35-4B. Add '(2B).' in the last column.

Xwpg501(Pdi)-4A,B,D. Add reference 0263 in the first column, i.e. '{0064, 0263}'.

Add:

Xbcd221-4B {0269}[2].		BCD221.	(2B, 6B).
Xbcd1975-4A {0269}[2].		BCD1975.	(7D).
Xbcd348-4A {0269}[2].		BCD348.	(2A,B,D).
Xcdo414-4A {0269}[2].		CDO414.	(7B).
Xcdo949-4A [{0242}].	[*Xcdo949b-4A* {0242}].	CDO949.	(4D).
Xgwm129-4D {0242}.		WMS F129/WMS R129.	(2B, 5A).
Xgwm613-4A {0269}[2].		WMS F613/WMS R613.	(6B).
Xstm91-4D {0242}.		STM 91F/STM 91R.	
Xutv135-4B {0269}[2].		UTV135.	(1A, 3B).
Xutv434-4A.3 [{0269}][2].	[*Xutv434d-4A* {0269}[2]].	UTV434.	(4AL).
Xutv1136-4A.1,.2 [{0269}][2].	[*Xutv1136a,c-4A* {0269}[2]].	UTV1136.	
Xutv1441-4B {0269}[2].		UTV1441.	(1A, 3B).
Xwg180-4B [{0242}].	[*Xwg180a-4B* {0242}].	WG180.	(1A, 7BS,L).
Xwmc47-4B [{0242}].	[*Xwmc047-4B* {0242}].	WMC 47F/WMC 47R.	(7A).
Xwmc48-4A,B,D [{0242}].	[*Xwmc048a-4A*, *Xwmc048c-4B*, *Xwmc048b-4D* {0242}].	WMC 48F/WMC 48R.	

Group 5S

Amendments:

Xabg873-5B. Revise the first column to '*Xbcd873-5B* {1059}, *5D* {0242}.' and add '(7A,D).' in the last column.

Xbcd207-5A. Revise the last column to '(1A,B).'.

Xgwm129-5A. Revise the last column to '(2B, 4D).'.

Xgwm443-5B. Add '(5A).' in the last column.

Xmwg835-5A. Revise the last column to '(1A,B,D, 2A).'.

Add:

Xabg397-5A {0242}.		ABG397.	(4D).
Xcdo465-5A {0269}[2].		CDO465.	(5AL,BL,DL).
Xgdm68-5D {0242}.		DMS 68F/DMS 68R.	(5A,B, 5DL).
Xgwm443-5A {0242}.		WMS F443/WMS R443.	(5B).
Xpsp3045-5B [{0253}].	[*Xpsp3045-5B.2* {0253}].	PSP3045F/PSP3045R.	(2A, 7D).
Xwg184-5A {0242}.		WG184.	(2D, 3D, 4D).

Xwmc149-5B {0242}.		WMC 149F/WMC 149R.	(2B).
Xwmc159-5A {0242}.		WMC 159F/WMC 159R.	
Xwmc233-5D {0242}.		WMC 233F/WMC 233R.	

Group 5L

Amendments:

Xabg473-5A,B,D. Revise the last column to '(6A,B).
Xbcd265-5A. Revise the last column to '(1A,B,D, 2B, 4B,D).'.
Xcdo346-5D. Revise the last column to '(1B, 2B).'.
Xcdo465-5A,B,D. Add '(5AS).' to the last column.
Xcdo1090-5A. Revise the last column to '(1A,B).'.
Xgdm68-5D. Revise the last column to '(5A,B, 5DS).
XksuA1-5B. Revise the last column to '(1B, 2D, 3B, 7D).'.
Xgwm271-5D. Add '(2B, 5B).' in the last column.
Xpsr370-5A,B,D. Add '(2B).' to the last column.
Xwg232-5A,B,D. Revise the last column to '(1A, 4A,B, 6B, 7A,B).'.

Add:

Xabg463-5B {0242}.		ABG463.	(4A,D, 5D).
Xcdo775-5B {0269}[2].		CDO775.	(7A,B,D).
Xcn111(Lpx-B2)-5B [{0269}][2].			
	[*Lox11-1* {0269}[2]].	LOX11-1.	
Xgwm271-5B [{0242}].		WMS F271/WMS R271.	(2B, 5D).
Xstm652-5B {0242}.		STM 652F/STM 652R.	
XsunG5-5B [{0242}].	[*XsunG5B-5B* {0242}].	SUN G5F/SUN G5R.	
Xucg2(Acc-2)-5D [{0265}].	[*Xucg2-5D* {0265}].	UCG2.	(3A,B,D).
Xunl1-5B {0247}.		UNL1.	
Xunl2-5B {0247}.		UNL2	
Xunl3-5B {0247}.		UNL3.	
Xutv497-5A {0269}[2].		UTV497.	
Xutv1435-5A {0269}[2].		UTV1435.	
Xwmc28-5B [{0242}].	[*Xwmc028-5B* {0242}].	WMC 28F/WMC 28R.	
Xwmc235-5B {0242}.		WMC 235F/WMC 235R.	
Xwmc376-5B {0242}.		WMC 376F/WMC 376R.	

4AL:5BL:5DL

Add:

Xcdo506-4A {0242}. CDO506.

A *Xcdo506-5D* locus has been reported in {1059} in the 7BS:5BL:5DL category. It is possible that this is a misclassification and that *Xcdo506-4A* and *Xcdo506-5D* are homoeologous.

Xwmc161-4A [{0242}].	[*Xwmc161a-4A* {0242}].	WMC 161F/WMC 161R.	
Xwmc258-4A {0242}.		WMC 258F/WMC 258R.	

Group 5

Amendments:

Xabg463-5D.1,.2. Revise the last column to '(4A,D, 5B).'.
Xcmwg645-5A. Revise the last column to '(1A,B,D).'.
Xgdm68-5A,B. Revise the last column to '(5DS, 5DL).'.
XksuF43-5D.1,.2. Revise the last column to '(1A,B,D, 2D, 4D, 6D).'.
Xmwg584-5D. Revise the last column to '(1A,B,D, 3A, 4A).
Xwg232-5A.1,B. Revise the last column to '(1A, 4A,B, 6B, 7A,B).'.
Xwg232-5A.2. Revise the last column to '(1A, 4A,B, 6B, 7A,B).'.
Xwg420-5D.1,.2. Revise the last column to '(7A,B,D).'.

Add:

Xabg3-5A,D [{0242}].	[*Xabg3b-5A* {0242}].	ABG3.	
Xbcd135-5D {0242}.		BCD135.	(2B,D, 4A).
Xgwm304-5A {0242}.		WMS F304/WMS R304.	
Xstm286-5B {0242}.		STM 286F/STM 286R.	
Xstm337-5A [{0242}].	[*Xstm337a-5A* {0242}].	STM 337F/STM 337R.	(7B).
Xwmc96-5A [{0242}].	[*Xwmc096-5A* {0242}].	WMC 96F/WMC 96R.	
Xwmc110-5A {0242}.		WMC 110F/WMC 110R.	

Group 6S

Amendments:

Xabg378-6A,D. Revise the last column to '(2A, 7A,4A).'.

Xbcd1398-6D. Revise the first column to '*Xbcd1398-6B* {0242}, *6D* {900}.'.

Xbcd1821-6A,D. Revise the first column to '*Xbcd1821-6A* {900}, *6B* {0244}, *6D* {900}.'.

Xcdo270-6A,D. Revise the first column to '*Xcdo270-6A* {900}[1], *6B* {0269}[2], *6D* {900}[1].'.

Xcdo365-6B. Add '(2B).' to the last column.

Xcdo534-6A,B,D. Revise the last column to '(1B, 3A, 7A).'.

Xfba307-6A,D. Revise the first column to '*Xfba307-6A* {900}, *6B* {0244}, 6*D* {900}.'.

Xfba381-6B,D.2. Revise the first column to '*Xfba381-6B.2,D.2* [{0081}]', add '[*Xfba381-6B* {0081}]' in the second column and revise the last column to '(6BL,DL)'.

Xfbb194-6A. Add '(4A).' to the last column.

Xgwm132-6B. Add '(6D).' to the last column.

Xgwm613-6B. Add '(4A).' to the last column.

Xgwm644-6B. Revise the first column to '*Xgwm644-6B* {9929}[1],{0269}[2].'

XksuF43-6D. Revise the last column to '(1A,B,D, 2D, 4D, 5D).'.

Xmwg573-6A.2,B,D. Revise the last column to '(6AL, 6BL).'.

Xpsr546-6A. Revise the first column to '*Xpsr546-6A.1* [{9927}][2].', add [*Xpsr546-6A* {9927}[2]].' in the second column, and revise the third column to '(6AL, 6BL,DL).'.

Add:

Xabg471-6B {0269}[2].		ABG471.	(3A,B).
Xbarc101-6B {0175}.		BARC F101/BARC R101 {0239}.	
Xbcd152-6B {0269}[2].		BCD152.	(2A,B).
Xbcd1299-6B {0269}[2].		BCD1299.	
Xfba175-6B.1 [{0244}].	[*Xfba175a-6B* {0244}].	FBA175.	(3A, 6BL).
Xgwm132-6D {0242}.		WMS F132/WMS R132.	(6B).
Xpsr119-6A [{0242}].	[*Xpsr119a-6A* {0242}].	PSR119.	(7A,4A,7D).
Xutv1151-6A.1,.2 [{0269}][2].	[*Xutv1151a,b-6A* {0269}[2]].	UTV1151.	(3A).
Xwmc104-6B {0032, 0276}		WMC F104/WMC R104 {0037}.	

Group 6L

Amendments:

Xabc175-6A,D. Revise the first column to '*Xabc175-6A* {9927}[2],{0081}[1], *6B* [{0242}][1], *6D* {900}[1].' and add '[*Xabc175a-6B* {0242}].' in the second column.

Xabg473-6B. Revise the first column to '*Xabg473-6A* {0242}, *6B* {900}.'.

Xabg652-6A. Add '(7A).' in the last column.

Xfba381-6D. Revise the first column to '*Xfba381-6B.1* [{0244}], *6D.1* [{900}]', revise the second column to '[*Xfba381-6B* {0244}, *6D* {900}]', and add '(6BS,DS)' in the last column.

Xgwm427-6A. Revise the first column to '*Xgwm427-6B* {9929}[1],{0269}[2].'.

XksuF37-6A,B. Add '(2B, 6D).' in the last column.

Xmwg573-6A.1. Revise the last column to '(6AS,BS,DS, 6BL).'.

Xpsr546-6B,D. Revise the last column to '(6AS, 6AL).'.

Add:

Xbcd279-6B {0269}[2].		BCD279.	

Xcdo686-6B {0269}[2].		CDO686.	(7B).
Xfba175-6B.2 [{0244}].	[*Xfba175b-6B* {0244}].	FBA175.	(3A, 6BS).
Xfbb185-6B [{0242}].	[*Xfbb185c-6B* {0242}].	FBB185.	(2B, 3B).
Xmwg573-6B {0242}.		MWG573.	(6AS,BS,DS, 6AL).
Xpsr546-6A.2 [{0242}].	[*Xpsr546a-6A* {0242}].	PSR546.	(6AS, 6BL,DL).
Xsun5-6D [{0242}].	[*XsunM5b-6D* {0242}].	SUN 5F/SUN 5R.	
Xutv1136-6A {0269}[2].		UTV1136.	
Xwg622-6A {0242}.		WG622.	(4A,B,D).
Xwmc163-6A {0242}.		WMC 163F/WMC 163R.	

Group 6

Amendments:

Xabc451-6D. Revise the last column to '(2A,B,D).'.
Xbcd221-6B. Add '(2B, 4B).' to the last column.
Xbcd1299-6B. Add '(6B).' to the last column.
Xbcd1495-6B. Add '(1B).' to the last column.
XksuE19-6D. Revise the last column to '(1A,B,D, 7B).'.
XksuF37-6D. Add '(2B, 6A,B).' to the last column.
Xwmc76-6B. Add '(7B).' to the last column.
Xwmc104-6B. Delete (entry moved to 6S).
Xwmg573-6D. Revise the last column to '(6AS,BS,DS, 6AL, 6BL).'.

Add:

Xwg232-6B [{0242}].	[*Xwg232b-6B* {0242}].	WG232.	(1A, 4A,B, 5A,B,D, 7A,B).
Xwmc416-6D {0242}.		WMC 416F/WMC 416R.	

Group 7S

Amendments:

Xabc158-7A. Revise the first column to '*Xabc158-7A* {1059}, *7B* {0242}.'.
Xabc465-7A,D. Revise the first column to '*Xabc465-7A* {282}[3], *7B* [{0242}][1], *7D* {9926}[4].', add '[*Xabc465a-7B* {0242}].' in the second column and add '(4A).' in the last column.
Xbcd310-7B. Revise the last column to '(1A,B).'.
Xcdo534-7A. Revise the last column to '(1B, 3A, 6A,B,D).'.
Xcdo1395-7A. Revise the last column to '(4B,D).'.
Xfba363-7A. Add '(4B).' in the last column.
Xgwm60-7A. Delete (entry moved to 7AS:4AL:7DS).
Xgwm537-7B. Revise the first column to '*Xgwm537-7B* {9929},{0242}.' and remove the sentence 'Whether *Xgwm537-7B.* belongs to the 7S arm group or the 7BS:5BL:5DL arm group is uncertain.'.
Xgwm631-7A. Delete (entry moved to 7L).
Xwg180-7B. Revise the last column to '(1A, 4B, 7BL).'.

Add:

Xgwm111-7D {9929, 0211}.	WMS F111/WMS R111.	(4A, 7BL).
Xgwm255-7B {0250}.	WMS F255/WMS R255.	
Xgwm263-7B {0250}.	WMS F263/WMS R263.	
Xgwm890-7A {0254}.	WMS F890/WMS R890.	
Xgwm913-7A {0254}.	WMS F913/WMS R913.	
Xgwm1002-7D {0250}.	WMS F1002/WMS R1002.	
Xgwm1065-7A {0254}.	WMS F1065/ WMS R1065.	
Xgwm1173-7B {0250}.	WMS F1173/WMS R1173.	
Xgwm1184-7B {0250}.	WMS F1184/WMS R1184.	
Xgwm1220-7D {0250}.	WMS F1220/WMS R1220.	

It is not known whether *Xwmc1220-7A* belongs to group 7S or 7AS:4AL:7DS.

Xsun16-7B {0256},[{0242}].
[*XsunM16-7B* {0242}]. SUN 16F/SUN 16R.
Xutv621-7B {0269}[2]. UTV621.
Xwmc17-7A [{0242}]. [*Xwmc017-7A* {0242}]. WMC 17F/WMC 17R.
It is not known whether *Xwmc17-7A* belongs to group 7S or 7AS:4AL:7DS.
Xwmc76-7B [{0242}]. [*Xwmc076-7B* {0242}]. WMC 76F/WMC 76R. (6B).
Xwmc83-7A {0153},[{0242}]. WMC 83F/WMC 83R {0161}.
Xwmc283-7A {0242}. WMC 283F/WMC 283R.
Xwmc338-7B {0242}. WMC 338F/WMC 338R.
It is not known whether *Xwmc338-7B* belongs to group 7S or 7BS:5BL:5DL.
Xwmc405-7A,D [{0242}]. [*Xwmc405a-7A* {0242}]. WMC 450F/WMC 405R.

7AS:4AL:7DS

Amendments:

Xabg378-7A. Revise the first column to '*Xabg378-7A* {282}[3], *4A* [{0242}][1].' and add '[*Xabg378b-4A* {0242}].' in the second column.
Xabg704-7A. Revise the first column to '*Xabg704-7A* {282}[3], *4A* {0242}[1], *7D* {[0242}][1].' and add '[*Xabg704c-7D* {0242}].' in the second column.
Xbcd129-7D. Revise the first column to '*Xbcd129-7A* {0242}, *7D* [{1059}] {1057}.'
Xbcd1975-7D. Add '(4A).' in the last column.
Xcdo665-4A. Add '(2A).' in the last column.
Xpsr604-7A,4A,7D. Add '(3B).' in the last column.
Xutv434-4A.2. Revise the last column to '(4AS, 4AL).'.

Add:

Xabc465-4A [{0242}]. [*Xabc465b-4A* {0242}]. ABC465. (7A,B,D).
Xabg75-7A,D [{0242}]. [*Xabg75b-7A*, *Xabg75a-7D* {0242}].
ABG75.
Xbcd135-7A, 4A [{0242}]. [*Xbcd135a-7A*, *Xbcd135b-4A* {0242}].
BCD135. (2B,D, 5D).
Xbcd873-7A,D [{0242}]. [*Xbcd873a-7A*, *Xbcd873b-7D* {0242}].
BCD873. (5B,D).
Xfbb194-4A {0242}. FBB194. (6A).
Xgwm60-7A {724,0250}. WMS F60/WMS R60.
Xstm271-7A {0242}. STM 271F/STM 271R.
It is not known whether *Xstm271-7A* belongs to group 7AS:4AL:7DS or 7S.
Xwmc262-4A {0242}. WMC 262F/WMC 262R.
Xwmc313-4A {0242}. WMC 313F/WMC 313R.

Group 7L

Amendments:

Xcdo414-7B. Add '(4A).' to the last column.
Xcdo686-7B. Add '(6B).' to the last column.
Xcdo775-7A,B,D. Add '(5B).' to the last column.
Xgwm111-7B,D. Revise the first column to '*Xgwm111-7B* [{0031}].' and revise the last column to '(4A, 7DS).'.
Xgwm332-7A. Revise the first column to '*Xgwm332-7A.3* [{9929}].', add '[*Xgwm332-7A* {9929}].' in the second column, and add '(7AS).' to the last column.
XksuA1-7D. Revise the last column to '(1B, 2D, 3B, 5B).'.
Xmwg938-7A. Revise the last column to '(1A,B,D).'.
Xpsr311-7A,B,D. Add '(3A).' to the last column.
Xutv1110-7A. Revise the first column to '*Xutv1110-7A* {9959}[2], *7B* {0269}[2].'.
Xutv1267-7A. Revise the first column to '*Xutv1267-7A* {9959}[2], *7B* {0269}[2].'.
Xwg180-7B. Revise the last column to '(1A, 4B, 7BS).'.
Xwg232-7A. Revise the first column to *Xwg232-7A* [{154}], *7B* [{0242}], add '[*Xwg232a-7B* {0242}]' in the second column, and revise the last column to '(1A, 4A,B, 5A,B,D, 6B).'.

Xwg420-7A,D. Revise the first column to '*Xwg420-7A* {282}[3], *7B* {0242}[1], *7D* {1059}[1].

Add:

Xabg652-7A {0242}.		ABG652.	(6A).
Xfba349-7A {0242}.		FBA349.	(2D).
Xgwm332-7A.1 [{0269}][2].	[*Xgwm332a-7A* {0269}[2]].	WMS F332/WMS R332.	(7AL).
Xgwm332-7A.2 [{0269}][2].	[*Xgwm332b-7A* {0269}[2]].	WMS F332/WMS R332.	(7AL).
Xgwm631-7A.{0178,0254}.		WMS F631/WMS R631.	
Xgwm698-7A {0254}.		WMS F698/WMS R698.	
Xgwm748-7A {0254}.		WMS F748/WMS R748.	
Xgwm767-7B {0250}.		WMS F767/WMS R767.	
Xgwm870-7A {0254}.		WMS F870/WMS R870.	
Xgwm871-7B {0250}.		WMS F871/WMS R871.	
Xgwm897-7B {0250}.		WMS F897/WMS R897.	
Xgwm963-7B {0250}.		WMS F963/WMS R963.	
Xgwm1044-7D {0250}.		WMS F1044/WMS R1044.	
Xgwm1061-7A {0254}.		WMS F1061/WMS R1061.	
Xgwm1066-7A {0254}.		WMS F1066/WMS R1066.	
Xgwm1085-7B {0250}.		WMS F1085/WMS R1085.	
Xgwm1083-7A {0254}.		WMS F1083/WMS R1083.	
XksuE19-7B {0242}.		pTtksuE19.	(1A,B,D, 6D).
Xrz508-7A.1 [{0269}][2].	[*Xrz508a-7A* {0269}[2]].	RZ508.	(7AL, 7B).
Xrz508-7A.2 [{0269}][2].	[*Xrz508b-7A* {0269}[2]].	RZ508.	(7AL, 7B).
Xutv507-7B {0269}[2].		UTV507.	
Xutv1521-7A {0269}[2].		UTV1521.	
Xwmc14-7D [{0242}].	[*Xwmc014-7D* {0242}].	WMC 14F/WMC 14R.	
Xwmc116-7A {0242}.		WMC 116F/WMC 116R.	
Xwmc157-7D {0242}.		WMC 157F/WMC 157R.	
Xwmc247-7A {0242}.		WMC 247F/WMC 247R.	
Xwmc346-7A {0242}.		WMC 346F/WMC 346R.	

Group 7

Add:

Xbcd410-7D. Revise the last column to '(2A,B,D).'.
Xbcd707-7D. Revise the first column to '*Xbcd707-7B* {0242}, *7D* {1059}.'.
XksuE7-7D. Add '(2B).' in the last column.
Xmwg539-7D. Add '(1A,B,D).' in the last column.
Xpsp3045-7D. Add '(2A, 5B).' in the last column.
Xwg232-7A.1. Revise the last column to '(1A, 4A,B, 5A,B,D, 6B, 7B).'.
Xwg232-7A.2. Revise the last column to '(1A, 4A,B, 5A,B,D, 6B, 7B).'.
Xwmc47-7A. Add '(4B).' in the last column.
Xwmc83-7A. Delete (the entry has been moved to group 7S).

Add:

Xcdo949-7B {0242}.		CDO949.	(4D).
Xstm337-7B [{0242}].	[*Xstm337b-7B* {0242}].	STM 337F/STM 337R.	(5A).
Xstm764-7A [{0242}].	[*Xstm764a-7A* {0242}].	STM 764F/STM 764R.	
Xwmc94-7D {0242}.	[*Xwmc094-7D* {0242}].	WMC 94F/WMC 94R.	
Xwmc121-7D {0242}.		WMC 121F/WMC 121R.	
Xwmc364-7B {0242}.		WMC 364F/WMC 364R.	
Xwmc402-7B {0242}.		WMC 402F/WMC 402R.	

Dormancy (Seed)

Cross AC Domain/Haryutaka: one major QTL in chromosome 4AL and two lesser possibly homoeologous QTLS in 4BL and 4DL {0226}.

Ear emergence

QEet.ipk-2D 2DS {0255}. **v:** Opata/W-7984 (ITMI) RI mapping population {0255}. Lateness was contrib uted by W-7984 {0255}.
ma: Associated with *Xfba400-2D* and *Xcdo1379* {0255}.

QEet.ipk-2D coincides with a QTL for flowering time, *QFlt.ipk-2D*. Both QTLs are likely to correspond to *Ppd-D1* {0255}

QEet.ipk-5D {0255}.
5DL {0255}. **v:** Opata/W-7984 (ITMI) RI mapping population {0255}. Lateness was contrib uted by W-7984 {0255}.
ma: Associated with *Xbcd450-5D* {0255}.

QEet.ipk-5D coincides with a QTL for flowering time, *QFlt.ipk-5D*. Both QTLs are likely to correspond to *Vrn-D1* {0255}.

Flowering time

QFlt.ipk-3A {0255}.
3AL {0255}. **v:** Opata/W-7984 (ITMI) RI mapping population {0255}. Lateness was contrib uted by W-7984 {0255}.
ma: Associated with *Xbcd451* {0255}.

Frost resistance

Responses to cold exposure and their genetics are reviewed in {0020,0274}.

Fr1. **ma:** *Fr1* mapped 2 cM proximal to *Xwg644-5A* and *Vrn-A1* {0291} and was flanked by deletion points 0.67 and 0.68 {0292}.

Fr2 {0291}. 5DL {0291}. **s:** CS*7/Cheyenne 5D {0291}.
ma: *Fr2* mapped 10 cM proximal to *Vrn-D1* {0291}.

QWin.ipk-6A 6AS {0255}. **v:** Opata/W-7984 (ITMI) RI mapping population {0255}. Winter hardiness was contributed by W-7984 {0255}.
ma: Associated with *Xfba85* and *Xpsr10(Gli-2)* {0255}.

Gluem colour

1. Red (brown/bronze)

Rg2.

QRg.ipk-1D {0255}.
1DS {0255}. **v:** Opata/W-7984 (ITMI) RI mapping population {0255}. The glume colour was contributed by W-7984 {0255}.
ma: Associated with *Gli-D1* {0255}.

This QTL coincides with a QTL for awn colour, *QRaw.ipk-1D* {0255}.

7. Awn colour

QRaw.ipk-1A {0255}.
1AS {0255}. **v:** Opata/W-7984 (ITMI) RI mapping population {0255}. The awn colour was contributed by W-7984 {0255}.
ma: Associated with *Gli-A1* {0255}.

QRaw.ipk-1D {0255}.
1DS {0255}. **v:** Opata/W-7984 (ITMI) RI mapping population {0255}. The awn colour was contributed by W-7984 {0255}.
ma: Associated with *Gli-D1* {0255}.

Grain hardness / Endosperm texture

Add at end of section:

QTL: Ten QTLs for kernel hardness (54 % of the variation) were mapped in a cross 'Forno'/ 'Oberkulmer' spelt {0280}.

Grain Quality Parameters

1. Sedimentation value

QTL: QTL associated with *Glu-1*on chromosome arms 1AL and 1DL and *Gli-1/Glu-3* on 1BS were detected in RSLs from the cross Cheyenne (high quality) x CS (low quality) {0251}. Cultivar Cheyenne contributed the higher SDS sedimentation values {0251}. The QTL on 1AL coincided with a QTL for bread loaf volume {0251}. The QTL on 1DL and 1BS coincided with QTL for bread mixing time {0251}.

4. Milling yield

QTL: A QTL associated with *Pinb* on chromosome arm 5DS was detected in RILs from the cross NY6432-18 x Clark's Cream {0241}. Cultivar Clark's Cream contributed the higher flour yield allele {0241}. This QTL coincided with QTL for hardness, hydration traits (dough water absorption, damaged starch and alkaline water retention capacity (AWRC), and baked product traits (cookie diameter and cookie top grain) {0241}.

5. Alveograph dough strength W

Add at the end of section:

QTL: Ten QTLs for W (39 % of the variation), nine QTLs for P (48% of the variation) and seven QTLs for P:L (38% of the variation) were mapped in 'Forno'/'Oberkulmer' spelt {0280}.

6. Mixograph peak time (new category)

QTL: A QTL associated with *Glu-Dy1* on chromosome arm 1DL was detected in RILs from the cross NY6432-18 x Clark's Cream {0241}. Cultivar Clark's Cream contributed the higher mixograph peak time allele {0241}. This QTL coincided with a QTL for bread mixing time {0241}.

Height

Rht-B1. Add at end of section: The line XN004, earlier considered to have *Rht21* {0230}, was shown to carry an allele at the *Rht-B1* locus {0231}.

Rht-D1. Add at end of section: The line XN004, earlier considered to have *Rht21* {0230}, was shown to carry an allele at the *Rht-D1* locus {0231}.

Various common wheat and durum NIL pairs differing at the *Rht-A1* or *Rht-D1 loci* are listed in {02102}.

Rht8a. Integrate alphabetically in the **v:** section:
Hope {0243}; Marquis {0243}; Michigan Amber {0243}.

Rht8b. Integrate alphabetically in the **v:** section:
Arthur {0243}; Carsten V {0243}; Diakovchanka {0243}; Odom {0243}; Oasis {0243}; Purdue Abe {0243}; Salzmünder Bartweizen 14/44 {0243}; Tp114/65 {0243}; Wiskonsin 245 C/11226 {0243};

Rht8c Integrate alphabetically in the **v:** section:
Al'batros odesskii {0243}; Arthur 71 {0243}; Donskaya polukarlikovaya {0243}; Erythrospermum 127 {0243}; Erythrospermum 1072 {0243}; Erythrospermum 272-87 {0243}; Erythrospermum 949-38 {0243}; Fakir {0243}; Fedorovka {0243}; Kaloyan {0243}; Khar'kovskaya 50 {0243}; Khar'kovskaya 93 {0243}; Khersonskaya 86 {0243}; Mv 03-89 {0243}; Mv 06-88 {0243}; Mv 17{0243}; Obrii {0243}; Odesskaya 51 {0243}; Odesskaya 117 {0243}; Odesskaya 132 {0243}; Odesskaya krasnokolosaya {0243}; Odesskaya polukarlikovaya {0243}; Roazon {0243}; Simvol odesskii {0243}; Sivka {0243}; Strumok {0243; Tira {0243}; Ukrainka odesskaya {0243}; Vympel {0243}; Yubileinaya 75 {0243}; Zolotava {0243}.

At the end of the list {1999 Suppl.} add: 'Although CS carries a 192 bp fragment, sequencing showed it was a different allele than other genotypes with *Rht8c* {02103}.'.

Rht8g. Associated with a 196-bp fragment of WMS 261 [{0243}]. **v:** Mirleben {0243}.

Rht8h. Associated with a 206-bp fragment of WMS 261 [{0243}]. **v:** Weihenstephan M1 {0243}.

Rht21 {0230}. 2DL {0230}. **v:** XN004 {0230}.
The existence of this gene could not be confirmed {0231}.

QHt.ipk-4A {0255}.
4AL {0255}. **v:** Opata/W-7984 (ITMI) RI mapping population {0255}. The height is contributed by Opata {0255}.
ma: Associated with *Xmwg549*, *Xabg390* and *Xbcd1670* {0255}.
QHt.ipk-4A coincides with QTLs for ear length (*QEl.ipk-4A*), grain number (*QGnu.ipk-4A*), and grain weight per ear (*QGwe.ipk-4A*) {0255}.
QHt.ipk-6A {0255}.
6A {0255}. **v:** Opata/W-7984 (ITMI) RI mapping population {0255}. The height is contributed by W-7984 {0255}.
ma: Associated with *Xcdo29* and *Xfba234* {0255}.
QHt.ipk-6A coincides with QTLs for peduncle length (*QPdl.ipk-6A*) and ear length (*QEl.ipk-6A*) {0255}

Leaf erectness (new category)
QLer.ipk-2A {0255}.
2AS {0255}. **v:** Opata/W-7984 (ITMI) RI mapping population {0255}. The erect leave... phenotype was contributed by Opata {0255}.
ma: Associated with *Xbcd348* {0255}.
Note: Mutants lacking ligules are known to have erect leaves. However, the QTL for leaf erectness reported here is not related to liguleless mutants {0255}.

Male sterility
ms1d {0290}. **v:** Mutant FS2 {0290}.

ms1e {0290}. **v:** Mutant FS3 {0290}.

ms1f {0290}. **v:** Mutant FS24 {0290}.

ms3. **ma:** *Xwg341-5A* – 0.8cM – *ms3* – cent {0289}. *Xcdo-677-5A* and *Xbcd1130-5A* also cosegregated with *Xwg341-5A* but were located in a different region in the physical map {0289}.

ms4 {0293}. 4DS {0293}. **v:** Konzak's male sterile.
Dominant allele for sterility, distinguished from *ms2* on the basis of different degrees of recombination with the 4D centromere.

ms5 {0290}. 3A {0290}. **v:** Mutant FS20 {0290}.

Meiotic characters
2. Pairing homoeologous
Ph1.
On a new line following the *ph1c* entry add: 'Several *ph1* mutants are described in {0219}.'.

ma: Add: PCR-based assays for presence and absence of *Ph1* have been described {0214, 0217, 9965}. The *Ph1* factor(s) was restricted to a region flanked by *Xrgc846-5B* and *Xpsr150-5B* {0219}.

Nucleolus organiser regions
Add at the end of descriptive paragraph and before allele descriptions:
'Deletion mapping divided the *Nor-B1* in a proximal subregion *Nor-B1p* (short repeat) and a distal subregion *Nor-B1d* (long repeat) {0275}'.

Proteins

1. Grain protein content

QTL: Nine QTLs (51 % of the variation) were mapped in cross ‘Forno’/‘Oberkulmer’ spelt {0280}.

QGpc.ndsu-6Bb. Add at the end of the **ma:** section: {0244} reports the location of this QTL in the 4 cM interval flanked by *Xmwg79-6B* and *Xcdo365-6B*.

QTL: A QTL for grain and flour protein content, contributed by CS, was associated with *XTri-1D/*Centromere in a RSL population from the cross Cheyenne (high quality wheat) x CS (low quality wheat) {0251}.

3. Endosperm storage proteins

3.1 Glutenins

Glu-A1

Add:

Glu-A1u [{02106}]. 2*^{B} {02106}. **v:** Bánkúti 1201.

At the end of the *Glu-A1* section, just before the entry for the *Glu-B1* locus, add the paragraph:
‘The allele designated *Glu-A1u* above and *Glu-A1-1u* in the appropriate list below encodes a high molecular weight glutenin subunit (denominated 2*^{B}) that is identical to subunit 2* apart from one amino acid difference involving the exchange of serine for cysteine (which itself is due to a C to G point mutation at the 1181-bp point of the coding region of 2*). The authors of {02106} suggest that the additional cysteine residue facilitates the formation of further disulphide bonds (cf. the 1Dx5 subunit) which might lead to an improvement in gluten quality characters.’

Glu-D1

Add:

Glu-D1al [{02107}]. 2.2* {02107}. **v:** MG315.

At the end of the *Glu-D1* section, just before the entry for the *Glu-1-1* and *Glu-1-2*, add the paragraphs:
‘The subunit 2.2* encoded by *Glu-D1al* above and *Glu-D1-1m* in the appropriate list below has an unusually high M_r; comparison of its N-terminal sequence and amino acid composition with those of subunit 2 (encoded by *Glu-D1-1a*) indicates that its greater M_r could be due to the presence of a larger central repetitive domain, although further evidence suggests that this does not affect the conformational properties of the subunit {02107}.

The alleles designated *Glu-D1w* (encoding ‘subunits’ 2 (or 2^{t} denoting its origin in the *Ae. tauschii* genome) +T1+T2), *Glu-D1ae* (encoding 2.1 (or 2.1^{t})+T1+T2), *Glu-D1af* (encoding 3 (or 3^{t})+T1+T2) and *Glu-D1ag* (encoding 1.5 (or 1.5^{t})+T1+T2) share the component T1 that was originally classified as a HMW glutenin. However, it has since been shown {02108} that this protein is soluble in aqueous ethanol, casting doubt upon this classification. More recently, it has been shown {02109}, from one- and two-dimensional gel electrophoresis based upon SDS-PAGE and A-PAGE, and from N-terminal sequencing, that this protein is an ω-gliadin of unusually low electrophoretic mobility in SDS-PAGE, encoded by a locus located on the short arm of chromosome 1D, though distant (13.18 cM) from the principal gliadin encoding locus on 1D, *Gli-D1*, and 40.20 cM from the high molecular weight encoding locus, *Glu-D1*. The authors named the locus *Gli-DT1* (see below, section ‘3.2 Gliadins’).’

Glu-A1-1

Add:

Glu-A1-1u [{02106}]. 2*^{B} {02106}. **v:** Bánkúti 1201.

Glu-D1-1

Add:

Glu-D1-1m [{02107}]. 2.2* {02107}. **v:** MG315.

Just before the entry for *Glu-E3*, add the following phrase to the previous paragraph (which, following the amendments made in the 2000 Supplement, reads: ‘In {00111}, in a study of bread and durum wheats from Portugal, the authors used the nomenclature system described in {00113} for the LMW subunits in bread wheat, and that described in {00114} for the LMW subunits in durum wheat.’): ‘The latter system, updated according to {02110}, is reproduced here:

Follow this with the following new entries:

Glu-B2

Add:

Glu-B2a {00114}.	12 {00114}.	**v:**	Mexicali, *T. durum*.
Glu-B2b {00114}.	Null {00114}.	**v:**	Langdon, *T. durum*.

Add at the end of the sentence 'The *Glu-3* loci are defined as the cluster of LMW glutenin genes previously considered a component of the compound *Gli-1* loci.'
'More than 30 LMW glutenin complete genes, partial genes or pseudogenes have been sequenced from *Triticum* species (reviewed in {0245}).

Glu-A3

Add:

Glu-A3a {00114}.	6 {00114}.	**v:**	Mexicali, *T. durum*.
Glu-A3b {00114}.	5 {00114}.	**v:**	Langdon, *T. durum*.
Glu-A3c {00114}.	6+10 {00114}.	**v:**	Cocorit, *T. durum*.
Glu-A3d {00114}.	6+11 {00114}.	**v:**	Alaga, *T. durum*.
Glu-A3e {00114}.	11 {00114}.	**v:**	Blatfort, *T. durum*.
Glu-A3f {00114}.	6+11+20 {00114}.	**v:**	Clarofino, *T. durum*.
Glu-A3g {00114}.	6+10+20 {00114}.	**v:**	Claro de Balazote, *T. durum*.
Glu-A3h {00114}.	null {00114}.	**v:**	Jiloca, *T. durum*.
Glu-A3i {02110}.	8*+11 {02110}.	**v:**	Mourisco Fino, *T. durum*.

Glu-B3

Add:

Glu-B3a {00114}.	2+4+15+19 {00114}.	**v:**	Mexicali, *T. durum*.
Glu-B3b {00114}.	8+9+13+16 {00114}.	**v:**	Langdon, *T. durum*.
Glu-B3c {00114}.	2+4+14+15+19 {00114}.	**v:**	Jiloca, *T. durum*.
Glu-B3d {00114}.	2+4+15+17+19 {00114}.	**v:**	Mundial, *T. durum*.
Glu-B3e {00114}.	2+4+15+16+18 {00114}.	**v:**	Granja Badajoz, *T. durum*.
Glu-B3f {00114}.	2+4+15+17 {00114}.	**v:**	Ardente, *T. durum*.
Glu-B3g {00114}.	2+4+15+16 {00114}.	**v:**	Claro de Balazote, *T. durum*.
Glu-B3h {00114}.	1+3+14+18 {00114}.	**v:**	Alaga, *T. durum*.
Glu-B3i {00114}.	7+8+14+18 {00114}.	**v:**	Blatfort, *T. durum*.
Glu-B3j {02110}.	4+6*+15+19 {02110}.	**v:**	Mourisco Fino, *T. durum*.
Glu-B3k {02110}.	8+9+13+16+19 {02110}.	**v:**	Faísca, *T. durum*.

At end of the Glutenins section, just before the heading '3.2 Gliadins', add the paragraph:
'The following loci, *Glu-D4* and *Glu-D5*, encoding low molecular weight subunits of glutenin (30-32 kDa) have been described in {02111}; the proteins encoded by them were first observed earlier {02114, 02115}, and the former was later tentatively assigned the symbol *Glu-4* {02116}, before its chromosomal location was established and the locus definitively named as *Glu-D4* in {02111}. While this locus is located on chromosome 1D (in accordance with the position on the group 1 chromosomes of the remaining glutenin encoding loci found to date), the locus *Glu-D5* is located on chromosome 7D. In SDS-PAGE, the proteins from both loci are detected only in the presence of 4-vinylpyridine added to the sample extract. Their amino acid composition does not match that of the major prolamin groups; nonetheless, they classify as glutenins based upon solubility, immunological behaviour and N-terminal amino acid sequence (the latter suggesting an evolutionary link with the major (B and C) low molecular weight glutenin subunits).'

Then add the following entries:

Glu-D4 {02111}.	1D {02111}.	**su:**	CS/Langdon 1D(1A); CS/Langdon 1D(1B) {02111}.
Glu-D4a {02111}.		**v:**	J 24.
Glu-D4b {02111}.		**v:**	PBW 154.
Glu-D4c {02111}.	null allele.	**v:**	NI 4.

Glu-D5 {02111}.	7D {02111}.	**su:**	CS/Langdon 7D(7A); CS/Langdon 7D(7B) {02111}.
Glu-D5a {02111}.		**v:**	PBW 154.
Glu-D5b {02111}.	null allele	**v:**	K 68.

Continue with the following paragraph:

'A collection of 173 *Triticum tauschii* accessions have been analysed for low molecular weight glutenin subunits by SDS-PAGE {02112}. 33 different patterns for B-subunits and 43 for C-subunits were identified, some of which were of identical electrophoretic mobility to those observed in bread wheat. Also observed were subunits with the same mobilities as the D-subunits and as the subunits encoded by the *Glu-D4* and *Glu-D5* loci. This variation represents a source of novel germplasm of potential value for breeding programmes aimed at improving the D-genome of bread wheat in the context of bread-making quality.'

3.2. Gliadins

Add at the end of the section, just before the heading '3.3 Other endosperm storage proteins', add the paragraph:

'A locus designated *Gli-DT1* controlling an ω-gliadin of *Ae. tauschii* has been mapped on the short arm of chromosome 1D between loci *Gli-D1* (strictly *Gli-D*^{t}*1*) and *Glu-D1* (strictly *Glu-D*^{t}*1*), 13.18 cM proximal to the former and 40.20 cM from the latter {02109}. The only ω-gliadin to date identified as being encoded by this locus, namely T1, is of unusually low electrophoretic mobility in SDS-PAGE gels and was formally thought to be a high molecular weight glutenin encoded by the *Glu-D*^{t}*1* locus of *Ae. tauschii* (see note following the *Glu-D1* list in section '3.1 Glutenins'). The authors speculate that, due to their similar relative map positions, the loci *Gli-A4*, *Gli-D4*, *Gli-R3*, *Gli-S*^{l}*4* and this locus, *Gli-DT1*, form a series of '*Gli-4*' orthologous loci. However, this should be interpreted in the light of the above discussion on *Gli-A3* and *Gli-A4*.'

Then add the entry:

Gli-DT1 {02109}. 1DS {02109}. **dv:** AUS18913 *Ae. tauschii*; L/18913 (synthetic 6X).
Gli-DT1a [{02109}]. T1. **dv:** AUS18913 *Ae. tauschii*; L/18913 (synthetic 6X).

Follow this entry with the following paragraph:

'Four new classes of low molecular weight proteins related to gliadins, though not sufficiently similar to be classified as such, have been reported in {02113}. One of the classes has no close association to previously described wheat endosperm proteins.'

5. Other proteins

5.6 Waxy proteins

At end of preamble add: 'Partial genomic clones of various diploid, tetraploid, and hexaploid wheats have been sequenced {0278,0279}.'

Wx-d1e {0234}. **v:** Tanikei A6599-4 {0234}. Relative to Kanto 107, Tanikei A6599-4 carries an alanine to threonine substitution at position 258 in the mature protein {0234}.

5.8. Puroindolines

Revised section: Puroindolines a and b are the major components of friabilin, a protein complex that is associated with grain texture (see 'Grain Hardness'). Hard wheats result from unique changes in the puroindoline amino acid sequence or, currently, four null forms {0295} of the completely linked genes (max. map distance 4.3 cM) {452}.

Pina-A*^{m}*1 {0083} 5A^{m}S {0083}. **dv:** *T. monococcum* DV92, G3116 {0083}
In *T. momococcum Pina-A*^{m}*1* is completely linked to *Gsp-A*^{m}*1* {0083}.

Pina-D1 5DS {452}. **v:** CS

Pina-D1a {452}.

v: Aurelio *Pinb-D1a* {0249}; Bellevue {0249}; Bezostaja *Pinb-D1b* {0249}; Bilancia *Pinb-D1a* {0249}; Bolero *Pinb-D1a* {0249}; Brasilia *Pinb-D1b* {0249}; Centauro *Pinb-D1a* {0249}; Cerere *Pinb-D1b* {0249}; Chinese Spring *Pinb-D1a* {452,0249}; Colfiorito *Pinb-D1b* {0249}; Cologna 21 *Pinb-D1b* {0249}; Courtot {0249}; David *Pinb-D1b* {0249}; Democrat *Pinb-D1b* {0249}; Etruria *Pinb-D1b* {0249}; Fortuna {0249}; Francia *Pinb-D1b* {0249}; Galaxie 0249}; Gemini *Pinb-D1b* {0249}; Genio *Pinb-D1b* {0249}; Gladio *Pinb-D1b* {0249}; Heron {1035}; Lampo *Pinb-D1a* {0249}; Leone *Pinb-D1a* {0249}; Leopardo *Pinb-D1a* {0249}; Libero *Pinb-D1a* {0249}; Livio *Pinb-D1a* {0249}; Marberg *Pinb-D1b* {0249}; Mentana *Pinb-D1a* {0249}; Mieti *Pinb-D1b* {0249}; MosË *Pinb-D1a* {0249}; Neviana *Pinb-D1a* {0249}; Newana *Pinb-D1b* {0249}; Oscar *Pinb-D1a* {0249}; Pandas *Pinb-D1b* {0249}; Pascal *Pinb-D1b* {0249}; Sagittario *Pinb-D1b* {0249};

Salgemma *Pinb-D1b* {0249}; Saliente *Pinb-D1b* {0249}; Salmone *Pinb-D1b* {0249}; Serena *Pinb-D1a* {0249}; Serio *Pinb-D1b* {0249}; Soissons {0249}; Veda *Pinb-D1b* {0249}; Zena *Pinb-D1b* {0249}.'

Pina-D1a is present in all soft hexaploid wheats and possibly all hard hexaploid wheats carrying a hardness mutation in puroindoline b {452,1035,0082, 0204}.

Pina-D1b {1035}. Null allele

v: Amidon *Pinb-D1a* {0249}; Barra *Pinb-D1a* {0249}; Butte 86 {1035}; Ciano *Pinb-D1a* {0249}; Dorico *Pinb-D1a* {0249}; Eridano {0249}; Falcon {1035}; Fortuna (USA) *Pinb-D1a* {0249}; Glenman *Pinb-D1a* {0249}; Golia *Pinb-D1a* {0249}; Guadalupe *Pinb-D1a* {0249}; Inia 66 *Pinb-D1a* {0249}; Jecora *Pinb-D1a* {0249}; Indice *Pinb-D1a* {0249}; Kalyansona {0249}; Manital *Pinb-D1a* {0249}; Mendos *Pinb-D1a* {0249}; Padus *Pinb-D1a* {0249}; Prinqual *Pinb-D1a* {0249}; Sibilia *Pinb-D1a* {0249}; Super X {0249}; Yecora Rojo {0204}.

i: Gamenya sel. {0298,0203}; Heron/7*Falcon sel. {0298, 0203}.

Present only in some hard hexaploid wheats. *Pina-D1b* is associated with harder texture than *Pinb-D1b*{0177, 0206}.

Pinb-A^{m}1 {0083}. 5A^{m}S {0083}. **dv:** *T. monococcum* DV92, G3116 {0083}.

In *T. momococccum Pinb-A^{m}1* is 0.1 cM proximal to *Pina-A^{m}1* and both loci are less than 36 kb apart.

Pinb-D1 5DS {452} **v:** CS**.**

Pinb-D1a {452}.

v: Amidon *Pina-D1b* {0249}; Aurelio *Pina-D1a* {0249}; Barra *Pina-D1b* {0249}; Bilancia *Pina-D1a* {0249}; Bolero *Pina-D1a* {0249}; Centauro *Pina-D1a* {0249}; Chinese Spring *Pina-D1a* {452,0249}; Ciano *Pina-D1b* {0249}; Dorico *Pina-D1b* {0249}; Fortuna (USA) *Pina-D1b* {0249}; Glenman *Pina-D1b* {0249}; Golia *Pina-D1b* {0249}; Guadalupe *Pina-D1b* {0249}; Hill 81 {452}; Inia 66 *Pina-D1b* {0249}; Jecora *Pina-D1b* {0249}; Idice *Pina-D1b* {0249}; Lampo *Pina-D1a* {0249}; Leone *Pina-D1a* {0249}; Leopardo *Pina-D1a* {0249}; Libero *Pina-D1a* {0249}; Livio *Pina-D1a* {0249}; Manital *Pina-D1b* {0249}; Mendos *Pina-D1b* {0249}; Mentana *Pina-D1a* {0249};MosË *Pina-D1a* {0249}; Neviano *Pina-D1a* {0249}; Oscar *Pina-D1a* {0249}; Padus *Pina-D1b* {0249}; Prinqual *Pina-D1b* {0249}; Serena *Pina-D1a* {0249}; Sibilia *Pina-D1b* {0249}.

Pinb-D1a is present in all soft hexaploid wheats and possibly all hard hexaploid wheats carrying the *Pina-D1b* mutation {452,1035,0082,0204}.

Pinb-D1b {452}. 5DS {452}.

i: Paha*2//Early Blackhull/5*Paha {02111,0203}; Early Blackhull der./5*Nugaines sel. {0298,0203}.

s: CS*7/Cheyenne 5D {452}.

v: Bezostaya *Pina-D1a* {0249}; Brasilia *Pina-D1a* {0249}; Cerere *Pina-D1a* {0249}; Colfiorito *Pina-D1a* {0249}; Cologna 21 *Pina-D1a* {0249}; David *Pina-D1a* {0249}; Democrat *Pina-D1a* {0249}; Etruria *Pina-D1a* {0249}; Francia *Pina-D1a* {0249}; Gemini *Pina-D1a* {0249}; Genio *Pina-D1a* {0249}; Gladio *Pina-D1a* {0249}; Marberg *Pina-D1a* {0249}; Mieti *Pina-D1a* {0249}; Newana *Pina-D1a* {0249}; Pandas *Pina-D1a* {0249}; Pascal *Pina-D1a* {0249}; Sagittario *Pina-D1a* {0249}; Salgemma *Pina-D1a* {0249}; Saliente *Pina-D1a* {0249}; Salmone *Pina-D1a* {0249}; Serio *Pina-D1a* {0249}; Thatcher {0204}; Veda *Pina-D1a* {0249}; Wanser {452}; Zena *Pina-D1a* {0249}; hard component of Turkey {0204}.

Pinb-D1b is a "loss-of-function" mutation resulting from the replacement of a glycine by a serine at position 46 {452}.

Pinb-D1c {0082} **v:** Avle {0082}; Reno {0082}; Tjalve {0082}; Bjorke {0082}; Portal {0082}.

Pinb-D1c is a "loss-of-function" mutation resulting from the replacement of a leucine by a proline at position 60 {0082}.

Pinb-D1d {0082}. **v:** Bercy {0082}; Mjolner {0082}.

Pinb-D1d is a "loss-of-function" mutation resulting from the replacement of a tryptophan by a arginine at po sition 44 {0082}.

Pinb-D1e {0204}. **v:** Gehun {0204}; Canadian Red {0204}; Chiefkan {0204}.

Pinb-D1e is a "loss-of-function" mutation resulting from the replacement of a tryptophan by a stop codon at position 39 {0204}.

Pinb-D1f {0204}. **v:** the hard component of Utac {0204}.

Pinb-D1f is a "loss-of-function" mutation resulting from the replacement of a tryptophan by a stop codon at position 44 {0204}.

Pinb-D1g {0204}. **v:** Andrews {0204}.

Pinb-D1g is a "loss-of-function" mutation resulting from the replacement of a cysteine by a stop codon at position 56 {0204}.

Pinb-D1b, *Pinb-D1c*, *Pinb-D1d*, *Pinb-D1e*, *Pinb-D1f*, or *Pinb-D1g* are present in hard hexaploid wheats not carrying the *Pina-D1b* (null) mutation {452,1035,0082,0204}.

Wheats with *Pinb-D1b* were slightly softer and a little superior to those with *Pina-D1b* in milling and bread-making characteristics although there was considerable overlap {0206}. Transgenic rice with the *Pina-D1a* and *Pinb-D1a* alleles possessed softer grain {0207}.

Genotypes for a selection of North American wheats are given in {0204}.

5.9. Histone H1 proteins

HstH1-A1 {0215}. 5AL {0215}. **v:** CS {0215}.

HstH1-B1 {0215}. 5BL {0215}. **v:** CS {0215}.

HstH1-D1 {0215}. 5DL {0215}. **v:** CS {0215}.
HstH1-D1a {0215}. **v:** CS {0215}; 18 others {0215}.
HstH1-D1b {0215}. **v:** Grekum 114 {0215}; Kirgizsky Karlik {0215}.

HstH1-A2 {0215}. 5AL {0215}. **v:** CS {0215}.
HstH1-A2a {0215}. **v:** CS {0215}.
HstH1-A2b {0215}. Null allele {0215}. **v:** Mara {0215}; 10 others {0215}.

HstH1-B2 {0215}. 5BL {0215}. **v:** CS {0215}.
HstH1-B2a {0215}. **v:** CS {0215}; 19 others {0215}.
HstH1-B2b {0215}. **v:** Excelsior {0215}.

HstH1-D2 {0215}. 5DL {0215}. **v:** CS {0215].

The relationship of this gene series with a *Hst-A1*, *Hst-B1*, *Hst-D1* series in group 5 chromosomes {0216} based on DNA hybridization studies was not established.

Response to tissue culture

Add at the end of the section:

QGpp.kvl-2A {0253}. 2AL {0253}. **v:** Ciano/Walter DH mapping population {0253}. The green plant percentage was contributed by Ciano {0253}.
ma: Associated with *Xpsp3045-2A* {0253}.
QGpp.kvl-2B.1 {0253}. 2BL {0253}. **v:** Ciano/Walter DH mapping population {0253}. The green plant percentage was contributed by Ciano {0253}.
ma: Associated with *Xgwm388-2B* {0253}.
QGpp.kvl-2B.2 {0253}. 2BL {0253}. **v:** Ciano/Walter DH mapping population {0253}. The green plant percentage was contributed by Ciano {0253}.
ma: Associated with AFLP markers {0253}.
QGpp.kvl-2A {0253}. 2AL {0253}. **v:** Ciano/Walter DH mapping population {0253}. The green plant percentage was contributed by Ciano {0253}.
ma: Associated with *Xpsp3045-2A* {0253}.

Response to vernalization

Vrn-B1. *Vrn2*. 5BL or 7BL. Add to reference {635}, i.e. {635,0282}.

In the final paragraph include reference 0202 with the first reference, i.e. {1173, 0202}.

Yellow berry tolerance

QTL: A QTL for yellow berry tolerance, contributed by RS111, was associated with *Xgwm190* and *Xgwm174* on chromosome 5D in a RIL population from RS111/CS {0237}. A tolerance QTL contributed by CS, the susceptible parent, was detected on 6B {0237}.

Yield components

1000-grain weight

QTgw.ipk-5A {0255}. 5AL {0255}. **v:** Opata/W-7984 (ITMI) RI mapping population {0255}. The higher yielding allele is contributed by W-7984 {0255}.
ma: Associated with *Xfba351* and *Xcdo1312* {0255}.

QTL: QTLs for grain size were identified on chromosome arms 1DS, 2DL, and 6BL in a RIL population from RS111/CS {0236}.

QTL: Eight QTLs for 1,000-kernel weight (54 % of the variation) were mapped in 'Forno'/'Oberkulmer' spelt {0280}.

Kernel number per spike

QGnu.ipk-4A {0255}. 4AL {0255}. **v:** Opata/W-7984 (ITMI) RI mapping population {0255}. Higher kernel number was contributed by Opata {0255}.
ma: Associated with *Xmwg549*, *Xabg390* and *Xbcd1670* {0255}.

QGnu.ipk-4A coincides with QTL for height (*QHt.ipk-4A*), spike length (*XEl.ipk-4A*), and grain weight per ear (*QGwe.ipk-4A*) {0255}.

Spike length

QEl.ipk-1B {0255}. 1BL {0255}. **v:** Opata/W-7984 (ITMI) RI mapping population {0255}. Longer ear was contributed by Opata {0255}.
ma: Associated with *Xbcd388* and *Xwg605* {0255} .

QEl.ipk-4A {0255}. 4AL {0255}. **v:** Opata/W-7984 (ITMI) RI mapping population {0255}. Longer ear was contributed by Opata {0255}.
ma: Associated with *Xmwg549*, *Xabg390* and *Xbcd1670* {0255}.

This QTL is likely to be a pleiotropic effect of the gene underlying the height QTL, *QHt.ipk-4A* {0255}.

QEl.ipk-5A {0255}. 5AL {0255}. **v:** Opata/W-7984 (ITMI) RI mapping population {0255}. Longer ear was contributed by W-7984 {0255}.
ma: Associated with *Xmwg522* {0255}.

Grain weight/ear

QGwe.ipk-2D {0255}. 2DS {0255}. **v:** Opata/W-7984 (ITMI) RI mapping population {0255}. Higher grain weight was contributed by Opata {0255}.
ma: Associated with *Xcdo1379* and *Xbcd1970* {0255} .

QGwe.ipk-4A {0255}. 4AL {0255}. **v:** Opata/W-7984 (ITMI) RI mapping population {0255}. Higher grain weight was contributed by Opata {0255}.
ma: Associated with *Xmwg549*, *Xabg390* and *Xbcd1670* {0255}.

QGwe.ipk-4A coincides with QTL for height (*QHt.ipk-4A*), spike length (*XEl.ipk-4A*) and grain number (*QGnu.ipk-4A*) {0255}.

Pathogenic Disease/Pest Reaction

Reaction to Barley Yellow Dwarf Virus

Bdv2. **tr:** TC14 {059,0201}.
v: TC14*2/Hartog {0225}; TC14/2*Spear {0201}; TC14/2*Tatiara {0225}.
ma: Complete association with *Xpsr129-7D*, *Xpsr548-7D*, *XksuD2-7D*, *XcslH81-7D*, and *Xgwm37-7D* selected as a diagnostic marker {0225}.

Reaction to *Diuraphis noxia*

Dn1. 7DS {0211}. **i:** Betta-Dn1 {0211}; Karee-Dn1 {0211}; Tugela-Dn1 {0211}.
ma: *Xgwm111-7D*$_{210}$ - 3.20 ± 0.20 cM – *Dn1* (0211}.

Dn2. 7DS {0211}. **i:** Betta-Dn2 (0211}; Karee-Dn2 {0211}; Tugela-Dn2 {0211}.
ma: *Xgwm111-7D*$_{200}$ – 3.05 ± 0.18 cM – *Dn2* {0211}.

Dn4. **v:** Halt {0209}.

Dn5. 7DS {0211}. **i:** Betta-Dn1 {0211}.
ma: *Xgwm111-7D*$_{220}$ – < 3.20 cM – *Dn5* {0211}.

Dn8 {0211}. 7DS {0211}. **i:** Karee-Dn8.
v: PI 294994 *Dn5Dn9* {0211}.
ma: *Xgwm635-7D*$_{100}$ – < 3.20 cM – *Dn8* {0211}.

Dn9 {0211}. 1DL {0211}. **i:** Betta-Dn9.
v: PI 294994 *Dn5Dn8* {0211}.
ma: *Xgwm642-7D*$_{180}$ – < 3.20 cM – *Dn9* {0211}.

Dnx {0211}. 7DS {0211}. **v:** PI 220127 {0211}.
ma: *Xgwm111-7D*$_{210}$ – 1.52 $\pm$ 0.15 cM – *Dnx* {0211].

Dnx was considered to be located at a locus different from *Dn1*, *Dn2*, or *Dn5* {0211}, which were likely to be identical or allelic.

Reaction to *Erysiphe graminis*

Pm4b. **ma:** *Pm4b* - 4.8cM - *Xgbx3119b* {0272}.

Pm5a {0257}. *Pm5*{787}. **v:** Add: 'Galaxie {0257}; Kutulukskaya {0257}; Lambros {0257}; Navid {0257}; Pagode {0257}; Regina {0257}; Sicco (0257}; Tarasque {0257}; Zolotistaya {0257}.'

Pm5b {0257}. *Mli* {540,558}. **v:** Add: Cucurova {0257}; Fruhprobst {0257}; Kirkpinar-79 {0257}; Kontrast {0257}; Ilona {0257}; Nadadores {0257}; Siete Cerros {0257}; Una {0257}; Wettiness {0257};

Pm5c {0257}. 7B {0257}. **v:** *T. sphaerococcum* cv. Kolandi {0257}.

Pm5d {0257}. 7B {0257}. **i:** IGV 1-455 = CI 10904/7*Prins {0257}; CI 10904/7*Starke {0257}.

Pm5e {0258}. *mlfz* {0259}. **v:** Fuzhuang 30 {0258}.
ma: *Xgwm1267-7B* – 6.6cM – *Pm5e* – 12.6cM – *Xubc405*$_{628}$ {0258}.

***Pm8*.** **ma:** A STS marker distinguishes *Pm17* from *Pm8* {0286}.

***Pm17*.** T1BL·1RS.
ma: A STS marker distinguishes *Pm17* from *Pm8* {0286}.

***Pm30*.** **ma:** *Pm30* – 5.6 cM – *Xgwm159-5B* {0163}.

Mlxbd {0259}. 7B {0259}. **v:** Xiaobaidong {0258}.

Add to genotype list: '{02104} (Hungarian wheats).'.

QTL: Several QTLs were detected in two 'RE714/Hardi' populations when tested at two growth stages and with different cultures over three years. The most persistent band effective QTL was located in the vicinity of *Xgwm174-5D* {0272}. Three QTLs, *QPm.vt-1B, QPm.vt-2A*, and *QPm.vt-2B*, with additive gene action, accounted for 50 % of the variation in a population developed from Becker/Massey {0284}.

QPm.ipk-2B {0255}. 2BS {0255}. **v:** Opata/W-7984 (ITMI) RI mapping population {0255}. Resistance was contributed by Opata {0255}.
ma: Associated with *Xcdo405* and *Xmwg950* {0255} .

QPm.ipk-4B {0255}. 4B {0255}. **v:** Opata/W-7984 (ITMI) RI mapping population {0255}. Resistance was contributed by W-7984 {0255}.
ma: Associated with *Xcdo795* and *Xbcd1262* {0255}.

QPm.ipk-7D {0255}. 7DS {0255}. **v:** Opata/W-7984 (ITMI) RI mapping population {0255}. Resistance was contributed by Opata {0255}.
ma: Associated with *Xwg834* and *Xbcd1872* {0255} .

Reaction to *Fusarium graminearum*

QFhs.ndsu-3B {9925,0175}.
3BS {9925}. **v:** Sumai 3 {9925,0175}.
ma: Associated with *Xbcd907-3B.2* (LOD>3) {9925} and microsatellite markers *Xgwm533* and *Xgwm493* {0175}. This QTL explained 41.6 % of the variation in the cross Sumai3/Stoa {0175}.

QTL: Two additional QTL for resistance to *Fusarium graminearum* were identified in the cross 'Sumai3/Stoa' {0175}. The QTL on 4BS was associated with *Xwg909* and the QTL on 6BS was associated with *Xbarc101* and *Xbcd1383* {0175}. The QTL associated with markers *Xgwm493/Xgwm533* (explaining 24.8 % of the variation), and *Xbarc101*/*Xbcd1383* were also identified in a RIL population from the cross 'ND2603/Butte 86' {0175}. In addition, one QTL on chromosome 3AL associated with *Xbcd941* and one on chromosome 6AS associated with *XksuH4* were identified in RILs from the cross 'ND2603/Butte 86' {0175}.
The resistance QTL on chromosome 3BS associated with *Xgwm493* and *Xgwm533* was also identified in a DH population of the cross 'CM-82036 (a Sumai 3 derivative) x Remus' {0240}. Additional QTL in this cross were detected on chromosome 5A, associated with *Xgwm293* and *Xgwm304*, and possibly on 1B, associated with *Glu-B1* {0240}.

For review see {0283}.

Reaction to *Heterodera avenae*

Cre8 {0220}. *CreF* {0012,0138}. 6B {0220}. [On basis of linkage with *Xbcd1* and *Xcdo347*].
v: Barunga {0220}; Festiguay {0012,0220}; Frame {0138, 0220}; Molineaux {0220}.
ma: Associated with a unique allele when probed with CDO367, which hybridizes to group 7L {1059}.

Reaction to *Mycosphaerella graminicola*

Stb5. **ma:** *Rc3* - 6.6cM- *Stb5* - 7.2cM - *Xgwm44*/Centromere {0186}.

Reaction to *Phaeosphaeria nodorum*

SnbTM. **ma:** $UBC521_{650}$ – 15 cM – *SnbTM* – 13.1 cM – $RC37_{510}$ {0212}. $UBC521_{650}$ was converted to a SCAR marker {0212}.

Reaction to *Pseudocercosporella herpotrichoides*

Pch1. 7A {0224}. **tv:** Five recombinant lines {0224}.

Reaction to *Puccinia graminis tritici*

Sr22. **ma:** Add: 'See also {0158}.'

Sr26. **ma:** Can be detected with several RFLP probes {0138}.

Sr31. T1BL·1RS: **v:** Cougar {0267}; Rawhide (heterogeneous) {0267}.

Sr36. **v:** GK KincsQ {0235}.

Sr38 {062}. Derived from *Ae. ventricosa*. See Reaction to *P. recondita tritici Lr37* and *P. striiformis tritici Yr17* for details.
v: Moisson derivatives Mx12 and Mx22 also carry *Sr38* {0213}.

Reaction to *Puccinia recondita*

Lr10. **v:** Scout 66 {02101}.

Lrk10. A receptor-like kinase. The locus *Xsfr1(Lrk10)-1A*, detected by the probe Lrk10, is completely linked with *Lr10* in chromosome 1AS {356}. *Lrk10* encodes a receptor-like kinase with extracellular and kinase domains {0297}. Using probe pLrk10-A, developed from the extracellular domain, six homologues were found in chromosomes 1A (1), 1B (3), and 1D (2) as well as group-1 chromosomes of *T. monococcum*, *Ae. tauschii*, and barley {0296, 0294}. Probes based on the kinase domain identified further homologues in chromosomes 3AS and 3BS as well as the corresponding regions in rice and maize {0294}. Both orthologous and paralogous evolution were suggested.

Lr11. **v:** Karl 92 *Lr3 Lr10* {02101}.

Lr12. **v:** AC Domain *Lr10 Lr34*{0228}.

Lr13. **v:** Hereward {0288}; Moulin {0288}; Pastiche {0288}. BH1146 *Lr34* {0268}.

Lr16. **v:** Arapahoe {02101}; Brule {02101}; Millenium {02101}; Redland {02101}; Vista {02101}.

Lr17b. 2A {1350}. **v:** Brock {0260}; Tarso {0229}; Norman {1350}.

Lr19. 7BL. **v:** 4 further derivatives of 88M22-149 {0232}.
ma: An STS marker closely linked and distal to *Lr19* was developed from an AFLP {0273}.

Lr21. **v:** McKenzie {0228}; WGRC2 = 'TA1649/3* Wichita' {0299}; WGRC7 = 'Wichita/TA1649//2*Wichita' {0299}.
dv: *Aegilops squarrosa* accessions**:** RL5289 = TA1599 {1241}; TA1649 {0299}; TA1691 {0299}; TA2378 {0299}; TA2470 {0299}; TA2483 {0299}; TA2495 {0299}; TA2527 {0299}; TA2528 {0299}.
ma: All members of the *Lr21* family carry a STS derivative of *ksuD14-1D* that has a resistance gene analogue structure {0299}.

Lr23. **v:** Cranbrook {02119}.

Lr26. T1BL·1RS: **v:** Cougar {0267}; Rawhide (heterogeneous) {0267}.
Lr34. **v:** Westphal 12 {0268}; BH1146 Lr13 {0268}.

Lr37 {062}. 2AS {062}. Derived from *Ae. ventricosa* .
<u>VPM1 and derivatives</u>: 2AS {062} = T2AL·2AS-$2N^vS$ {0213}.
i: Tc*8/VPM1 {316}; Various NILs listed in {0213}.
v: Hyak {021}; Madsen {020}; Rendezvous {062}; VPM1 {062}. See also Reaction to *P. striiformis tritici Yr17*.
<u>Moisson derivatives</u>: *Lr* {113}. 2AS = T2AL·2AS-$2N^vS$ {113}.
ad: Moisson + $6N^v$ = $6N^vS.6N^vL-2N^vS$ or $6N^vL.6N^vS-2N^vS$ {0009}.
v: Mx12 {0213}; Mx22 {0213}.
ma: (relevant to both groups of derivatives). PCR primers designed from marker csVrga1D3' {0183} producing a 383 bp product allows detection of the $2N^vS$ segment {0213}. See also: Reaction to *P. striiformis tritici Yr17*.

Lr37 can be recognised in seedling tests at low temperatures (17°C) and is effective in adult plants under field conditions.

Lr39 {02100}. 2DS {02100}. Derived from *Aegilops tauschii* {02100}.
v: TA4186 = TA1675*2/Wichita {02100}.
dv: *Aegilops tauschii* TA 1675 {02100}.
ma: 10.7 cM distal to *Xgwm210-2D* {02100}.

Lr41. **v:** Thunderbolt {02100}.
.
Lr50 {0221}. 2BL {0221} [Based on linkage with SSR markers].
v: WGR36 = TAM107*3/TA870//Wichita {0221}.
tv: *T. armeniacum* TA870 {0221}.

LrTm {0277}. **dv:** *T. monococcum*.
ma: Linked to microsatellite locus *Xgwm136* {0277}.

LrTr {0227]. **v:** *Aegilops triuncialis* derivatives {0227}.
ad: WL711 BC2F5 addition lines {0227}.
al: *Aegilops triuncalis* Acc. 3549 {0227|.
ma: Lines with *LtTr* possessed a homologue of *Xgwm368-4B* {0227}.

Genotype lists: Australian wheats {0288}, European wheats {0229, 0260, 0288}.

Reaction to *Puccinia striiformis tritici*

Yr9. T1BL·1RS: **v:** Cougar {0267}; Rawhide (heterogeneous) {0267}.

Yr10. YrVav {0262}. **v:** QLD709 = Janz*2/*T. vavilovii* {0262}.
tv: *T. vavilovii* AUS 22498 {0262}.
ma: A SCAR marker was described in {0261}. QLD709 and *T. spelta* 415, both with white glumes, failed to amplify the SCAR sequence, but both carried unique alleles at the *Gli-B1* and *Xpsp3000* loci {0262}. These differed from the Moro source of *Yr10*} *Yr10* – 1.5 ± 0.9 cM – *Gli-B1* – 1.1 ± 0.8 cM – *XPsp3000* {0262}.

Yr17 {062}. 2AS {062}. See reaction to *P. recondita tritici Lr37* for details.
v: Genotype list in {02105}.
v: Arche {0044}, Balthazar {0044}, Brigadier {0044}, Cordial {0044}, Eureka {0044}, Hussar {0044}, Lynx {0044}, Pernel {0044}, Renan {0044}.
ma: *Yr17* was closely linked to the SCAR marker SC-Y15, developed from RAPD marker OP-$Y15_{580}$, and to *Xpsr150-2N*^{v} {0044}.

Yr26. 1BS {0285}. The earlier reported location of T6AL·6VS {617} is not correct.
v: Wheat-*Haynaldia villosa* lines R43, R55, R64, and R77 {0285}.
tv: *T. turgidum* Gamma 80-1.
ma: *Yr26* – 1.9 cM – *Xgwm11-1B/Xgwm18-1B* {0285}.

Yr28. **ma:** Linkage with *Xmwg634-4D* {1377}.

YrH52.
QTL: In the ITMI mapping population, QTLs were found in 2BS, 7DS, and possibly 5A, 3D, and 6D {0287}. In Camp Remy/Michigan Amber, QTLs were found in 2AL and 2BL {0287}.

Reaction to *Pyrenophora tritici repentis*
2. Resistance to chlorosis induction
QTsc.ndsu-1A. Add {0040,0264}' to the references for QTL and the marker association.

QTsc.ndsu-4A. Add to: **v:** In W-7976/Trenton resistance was contributed by W-7976 {0264}.
ma: Add: 'In W-7976/Trenton there was association with *Xwg622-4A*{0264} and minor QTLs in chromosomes 1AL, 7DS, 5AL, and 3BL were associated with resistance in adult plants {0264}.

Reaction to *Sitodiplosis mosellana*
Insect pest: Orange blossum wheat midge, Wheat midge

Sm1 {0218}. 2B{0218}. **v:** Augusta {0218}; Blueboy {0218}; Caldwell {0218}; Clark {0218}; FL302{0218}; Howell {0218} Knox 62 {0218}; Mono {0218}; Seneca {0218}.
ma: Linked to a SCAR marker {0223}.

Reaction to *Ustilago tritici*
Add: Resistance to race 19 was associated with chromosome 6A of Cadet, Kota, Thatcher, and TD18 {0208}. In the case of Cadet, resistance was localized to 6AS {0208}.

Resistance to colonization by *Eriophyes tulipae*
Curl mite colonization
Cmc1. **v:** Norstar derivative {0222}.

Cmc3 {0222}. 1A = T1AL·1RS. **v:** Amigo; TAM107. KS96GRC40 *Cmc4* {0222}.

Cmc4 {0222}. 6DS {0222}. **v:** KS96WRC40 *Cmc3* {0222}.
dv: *Aeg. Tauschii* (accession no {0222}.

Genetic Linkages

To the references in the first paragraph in the 2001 Supplement, add: '187'.

<u>Chromosome 4D</u>
4DS
ms4 – *centromere* I {0293}.

Summary Table 1
Add:

Ar	Alkylresocinols content of grain
Eet	Ear emergence time
El	Ear length
Flt	Flowering time
Gnu	Grain number
Gpp	Green plant percentage
Gwe	Grain weight/ear
Ler	Leaf erectness
Pdc	Pyruvate decarboxylase
Pdl	Peduncle length
Raw	Red awn colour
Tgw	1000-grain weight
Win	Winter hardiness

References

Amendments.

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VI. ABBREVIATIONS USED IN THIS VOLUME.

Plant diseases, pests, and pathogens:

BYDV = barley yellow dwarf virus
BMV = barley mosaic virus
CCN = cereal cyst nematode, *Heterodera avenae*
FHB = Fusarium head blight
RWA = Russian wheat aphid
SBMV = soilborne mosaic virus
SLB = Septoria leaf blotch
WSBMV = wheat soilborne mosaic virus
WSMV = wheat streak mosaic virus
WSSMV = wheat spindle streak mosaci virus
E. graminis* f.sp. *tritici = *Erysiphe graminis* f.sp. *tritici* = the powdery mildew fungus
F. graminearum = *Fusarium graminearum* = head scab fungus
F. nivale = **Fusarium nivale** = snow mold fungus
H. avenae = *Heterodera avenae* = cereal cyst nematode
P. recondita* f.sp. *tritici = *Puccinia recondita* f.sp. *tritici* = leaf rust fungus
P. striiformis* f.sp. *tritici = *Puccinia striiformis* f.sp. *tritici* = strip rust fungus
P. graminis = *Polymyxa graminis* = wheat soilborne mosaic virus vector
R. cerealis = *Rhizoctonia cerealis* = sharp eyespot
R. solani = *Rhizoctonia solani* = Rhizoctonia root rot
R. padi = *Rhonpalosiphum padi* = bird cherry-oat aphid
S. tritici = *Septorai tritici* = Septoria leaf spot fungus
S. graminearum = *Schizaphus graminearum* = greenbug
St. nodorum = *Stagonospora nodorum* = Stagonospora glume blotch
T. indica = *Tilletia indica* = Karnal bunt fungus

Scientific names and synonyms of grass species (note: classification according to van Slageren, 1994):

A. strigosa = *Avena strigosa*
Ae. cylindrica = *Aegilops cylindrica* = *Triticum cylindricum*
Ae. geniculata = *Aegilops geniculata* = *Aegilops ovata* = *Triticum ovatum*
Ae. speltoides = *Aegilops speltoides* = *Triticum speltoides*
Ae. tauschii = *Aegilops tauschii* = *Aegilops squarrosa* = *Triticum tauschii*
Ae. triuncialis = *Aegilops triuncialis* = *Triticum triunciale*
Ae. umbellulata = *Aegilops umbellulata* = *Triticum umbellulatum*
Ae. peregrina = *Aegilops peregrina* = *Aegilops variabilis* = *Triticum peregrinum*
Ae. ventricosa = *Aegilops ventricosa* = *Triticum ventricosum*
S. cereale = *Secale cereale* = rye
T. aestivum = *Triticum aestivum* = hexaploid, bread, or common wheat
T. monococcum* subsp. *aegilopoides = *Triticum boeoticum*
T. dicoccon = *Triticum dicoccon* = *T. dicoccom*
T. durum = *Triticum durum* = durum, pasta, or macaroni wheat
T. macha = *Triticum macha*
T. militinae = *Triticum militinae*
T. spelta = *Triticum spelta*
T. timopheevii* subsp. *timopheevii = *Triticum timopheevii*
T. timopheevii* subsp. *armeniacum = *Triticum araraticum* = *T. araraticum*
T. turgidum* subsp. *dicoccoides = *Triticum dicoccoides* = wild emmer wheat
T. turgidum* subsp. *dicoccom = *Triticum dicoccum*
T. urartu = *Triticum urartu*
Th. bessarabicum = *Thinopyrum bassarabicum*

Scientific journals and publications:

Agron Abstr = Agronomy Abstracts
Ann Wheat Newslet = Annual Wheat Newsletter
Cereal Res Commun = Cereal Research Communications
Curr Biol = Current Biology
Eur J Plant Path = European Journal of Plant Pathology
Int J Plant Sci = International Journal of Plant Science
J Cereal Sci = Journal of Cereal Science
J Hered = Journal of Heredity
J Phytopath = Journal of Phytopathology
J Plant Phys = Journal of Plant Physiology
Mol Gen Genet = Molecular and General Genetics
PAG = Plant and Animal Genome (abstracts from meetings)
Plant Breed = Plant Breeding
Plant, Cell and Envir = Plant, Cell and Environment
Plant Cell Rep = Plant Cell Reporter
Plant Physiol = Plant Physiology
Sci Agric Sinica = Scientia Agricultura Sinica
Theor Appl Genet = Theoretical and Applied Genetics
Wheat Inf Serv = Wheat Information Service

Units of measurement:

bp = base pairs
bu = bushels
cM = centimorgan
ha = hectares
T = tons
m^3 = cubic meters
μ = micron
me = milli-equivalents
mmt = million metric tons
mt = metric tons
Q = quintals

Miscellaneous terms:

Al = aluminum
AFLP = amplified fragment length polymorphism
ANOVA = analysis of variance
A-PAGE = acid polyacrylamide gel electrophoresis
AUDPC = area under the disease progress curve
BW = bread wheat
CHA = chemical hybridizing agent
CMS = cytoplasmic male sterile
CPS = Canadian Prairie spring wheat
DH = doubled haploid
DON = deoxynivalenol
ELISA = enzyme-linked immunosorbent assay
EMS = ethyl methanesulfonate
EST = expressed sequence tag
FAWWON = Facultative and Winter Wheat Observation Nursery
GA = gibberellic acid
GM = genetically modified
HPLC = high pressure liquid chromatography

HMW = high-molecular weight (glutenins)
HRSW = hard red spring wheat
HRRW = hard red winter wheat
HWSW = hard white spring wheat
HWWW = hard white winter wheat
kD = kilodalton
LMW = low molecular weight (glutenins)
MAS = marker-assisted selection
NILs = near-isogenic lines
NIR = near infrared
NSW = New South Wales, region of Australia
PAGE = polyacrylamide gel electrophoresis
PCR = polymerase chain reaction
PFGE = pulsed-field gel electrophoresis
PMCs = pollen mother cells
PNW = Pacific Northwest (a region of North America including the states of Oregon and Washington in the U.S. and the province of Vancouver in Canada)
PPO = polyphenol oxidase
QTL = quantative trait loci
RAPD = random amplified polymorphic DNA
RFLP = restriction fragment length polymorphism
RILs = recombinant inbred lines
SAMPL = selective amplification of microsatellite polymorphic loci
SAUDPC = standardized area under the disease progress curve
SCAR = sequence-characterized amplified region
SDS-PAGE = sodium dodecyl sulphate polyacrylamide gel electrophoresis
SH = synthetic hexaploid
SNP = single nucleotide polymorphism
SRPN = Southern Regional Performance Nursery
SRWW = soft red winter wheat
SRSW = soft red spring wheat
STMA = sequence tagges microsatellite site
SWWW = soft white winter wheat
SSD = single-seed descent
SSR = single-sequence repeat
STS = sequence-tagged site
TKW = 1,000-kernel weight
UESRWWN = Uniform Experimental Soft Red Winter Wheat Nursery

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X. VOLUME 49 MANUSCRIPT GUIDELINES.

Manuscript guidelines for the *Annual Wheat Newsletter*, volume 49. The required format for Volume 49 of the *Annual Wheat Newsletter* will be similar to Volume 48 and previous editions.

CONTRIBUTIONS MAY INCLUDE:

—Current activities on your projects.
—New cultivars and germ plasm released.
—Special reports of particular interest, new ideas, etc., normally not acceptable for scientific journals.
—A list of recent publications.
—News: new positions, advancements, retirements, necrology.
—Wheat stocks; lines for distribution, special equipment, computer software, breeding procedures, techniques, etc.

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Follow the format in volume 44–48 of the *Newsletter* in coördinating and preparing your contribution, particularly for state, station, contributor names, and headings. Limited editing is done. Use the WordPerfect or Word programs, or send an RTF file that can be converted. Use Times 12 CPI and 1.0" (2.5 cm) margins. DO NOT use the table settings or column setting functions, create tables with tabs and spaces. Double-space the text of your contribution if you must use a typewriter.

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In the interest of remaining solvent, the NWIC has approved future distribution primarily by computer diskette. We are asking that you renew your contribution or, if you have not contributed in the past, to join the growing list of contributors. Contributions from individuals in the range of $15 to $30 play a significant role in financing the Newsletter. An increase in the number of individual contributors is very important, and we are confident that, with continued corporate support, we will be able to meet our financial obligations in 2003. The address for contibutions is Dr. Brett Carver, Department of Agronomy, Oklahoma State University, Stillwater, OK 74078, U.S.A.