NRPN: location of replicated yield trials and regional production zones.

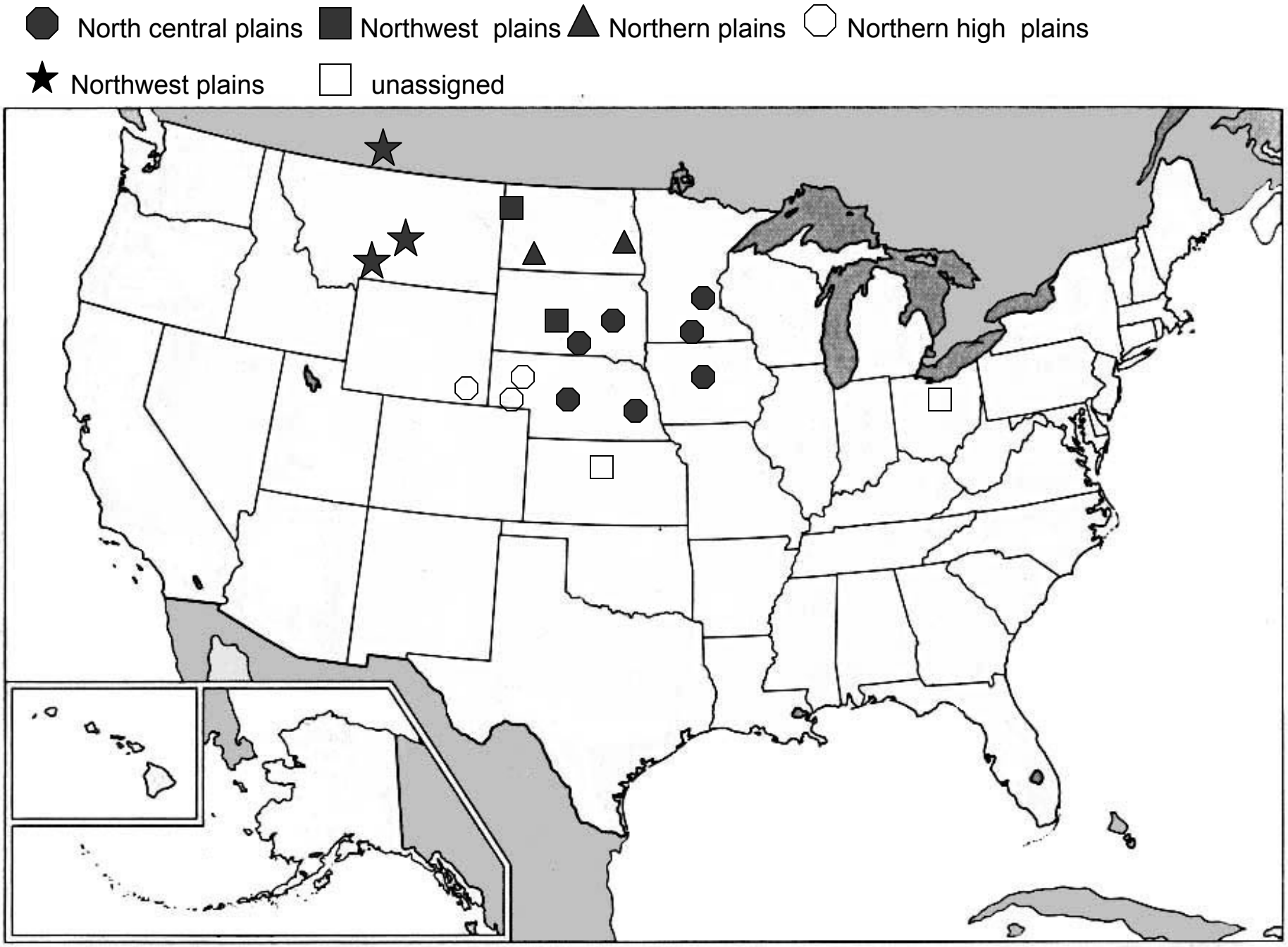

Table 1. 2003 NRPN location notes

Location	Notes
Salina, KS	
Lincoln, NE	
North Platte, NE	
Sidney, NE	
Alliance, NE	lost, drought
Brookings, SD	
Dakota Lakes, SD	
Winner, SD	
Ames, IA	planted 9/25/2002 and harvested 7/11/2003
Casselton, ND	
Williston, ND	Planted: Sept 11, 2002 on Fallow. Applied Fertilizer in lbs/a: 45N:40P2O5:0K:24S2O4 Soil Test to two feet in lbs/a: 67N:16P:400K:49S OM-1.9% pH-6.1 Soil Type: Williams loam Stand establishment was excellent. Harvested: July 24
Hettinger, ND	There was no seed germination prior to freeze up in the fall due to extremely dry soil conditions. This was essentially a dormant seeded trial with germination, emergence and vernalization occuring in the spring.
Bozeman, MT	
Moccasin, MT	
Archer, WY	lost, drought & hail
Rosemount, MN	
Waseca, MN	
Wooster, OH	
Lethbridge, Alberta	

Table 2. 2003 Northern Regional Performance Nursery

Entry	Line/selection	Putative market class	Cultivar or pedigree	source
1	Kharkof	HRW	Kharkof	check
2	Roughrider	HRW	Roughrider	check
3	Nuplains	HWW	Nuplains	check
4	Nekota	HRW	Nekota	check
5	G980172W	HWW	SW/IKE	Westbred
6	G980723	HRW	94CGT-96HV (BULK SELECTION)	Westbred
7	G980926 W	HWW	95CGT-96WD (BULK SELECTION)	Westbred
8	NW97S412-1	HWW	KS87809-10/ARAPAHOE	ARS-LNK
9	NW97S142-1	HWW	KSSB-192-3/NE89529	ARS-LNK
10	NW97S139-1	HWW	KSSB-192-3/NE89529	ARS-LNK
11	NW97S139-2	HWW	KSSB-192-3/NE89529	ARS-LNK
12	NW99L7068	HWW	KS84HW1968*RioBlanco/HBY762A//Halt	ARS-LNK
13	NW99L7083	HWW	KS84HW1968*RioBlanco/HBY762A//Halt	ARS-LNK
14	NW99L7171	HWW	VH09553-753/N91L019//AP-WI89-163	ARS-LNK
15	NW98S097	HWW	WA691213-27/N86L177//AP-WI89-163	ARS-LNK
16	NW97S218-lt	HWW	NW97S218 (KS85W663-1-1/KARL92) selection	ARS-LNK
17	NE99495	HRW	ALLIANCE/KARL 92	UNL
18	NI01808	HRW	KS831936-3/NE86501/3/SENTRY/ LEWJAIN/2/WA007432	UNL
19	NI01824	HRW	INTENSIVNAJA/NE92458 (=OK83201/REDLAND)//VBF0168	UNL
20	NE99464	HRW	NE86606/RAWHIDE//ABILENE	UNL
21	NE99489	HRW	NE90625/NE91525//KARL 92	UNL
22	NE00658	HRW	NE93462 (=ARAPAHOE/NAHW-81-170)/NE92608 (=NE82413/COLT)	UNL
23	NE00679	HRW	NE93462 (=ARAPAHOE/NAHW-81-170)/NE90616 (=ARAPAHOE/COLT)	UNL
24	MT9426	HRW	MT8030/Neeley	Montana State Univ
25	SD97049	HRW	ND8889/Karl	SDSU
26	SD97250	HRW	ND90109/NE87613	SDSU
27	SD98102	HRW	2076-W12-11/KARL 92//NE89526	SDSU
28	SD96306	HRW	SD88185/SD88201	SDSU
29	SD97380-2	HRW	Rawhide/Siouxland	SDSU
30	SD97394-1	HRW	Rose/SD88201	SDSU
31	SD98243	HRW	KS84063-9-39-3/NE86606	SDSU
32	SD97250-2	HRW	ND90109/NE87613	SDSU
33	SD97059-2	HRW	ND8889/NE90574	SDSU
34	SD97W609	HWW	Abilene/Karl	SDSU
35	SD97W650	HWW	Dawn/RioBlanco	SDSU

Table 3. Agronomic summary of 35 hard winter wheats entered in the 2003 NRPN.

Entry	Line/selection	Grain yield, kg/ha mean	Grain yield, kg/ha rank	Volume weight, kg/hl mean	Days from 1/1 to heading mean	Plant height, cm mean	Winter Survival, 0-100[a] mean	Grain protein conc. (%)[b] mean
1	Kharkof	3209	35	76.7	164	110	88	15.2
2	Roughrider	3501	34	76.5	164	102	89	15.0
3	Nuplains	4059	28	76.9	163	80	75	13.5
4	Nekota	4066	27	75.2	159	81	77	13.6
5	G980172W	4335	13	76.4	162	79	73	13.0
6	G980723	4298	14	76.2	161	76	68	13.6
7	G980926 W	4165	21	73.7	160	76	54	13.0
8	NW97S412-1	3880	30	69.6	161	75	47	13.9
9	NW97S142-1	4158	22	77.4	163	78	68	14.1
10	NW97S139-1	4069	26	72.0	160	78	67	13.1
11	NW97S139-2	4115	24	73.2	160	76	62	13.4
12	NW99L7068	4432	3	72.4	157	78	76	12.5
13	NW99L7083	4373	8	71.6	157	77	73	12.6
14	NW99L7171	3794	32	73.8	162	92	60	14.2
15	NW98S097	3795	31	73.9	162	79	59	13.7
16	NW97S218-lt	4033	29	74.2	162	81	65	13.3
17	NE99495	4227	16	74.0	159	81	76	13.1
18	NI01808	4215	17	68.3	163	82	73	13.6
19	NI01824	4356	11	75.7	158	80	71	12.9
20	NE99464	4171	20	75.6	161	84	74	13.5
21	NE99489	4364	9	73.9	161	88	68	13.8
22	NE00658	4181	19	72.6	161	86	69	13.6
23	NE00679	4356	10	70.2	161	86	80	13.0
24	MT9426	3785	33	69.9	164	84	76	13.3
25	SD97049	4133	23	73.8	159	81	75	13.1
26	SD97250	4082	25	74.2	161	87	85	13.5
27	SD98102	4406	5	75.0	162	88	77	13.4
28	SD96306	4388	7	74.6	161	90	74	13.8
29	SD97380-2	4484	1	73.9	160	89	79	13.7
30	SD97394-1	4394	6	73.6	161	91	67	13.5
31	SD98243	4346	12	73.8	159	83	73	13.2
32	SD97250-2	4207	18	74.1	161	88	76	13.3
33	SD97059-2	4458	2	73.8	162	90	81	13.8
34	SD97W609	4271	15	74.5	159	75	71	13.2
35	SD97W650	4410	4	74.6	158	79	74	13.1
	mean	4158		73.9	161	84	72	13.5

[a]Reported from 5 locations, values normalized to 0-100 scale with 0= no survival and 100 = 100% survival.
bReported from 6 locations

Table 4. Mean grain yields (kg/ha) and ranks for 35 wheats grown in the 2003 NRPN.

		region		Salina, KS		Nebraska state		Lincoln, NE		North Platte, NE		Sidney, NE	
Entry	Line or selection	mean	rank	mean	rank	mean	rank	mean	rank	mean	rank	mean	rank
1	Kharkof	3209	35	4415	13	3145	34	3834	33	2570	33	3030	25
2	Roughrider	3501	34	4203	21	2931	35	3825	34	2362	35	2606	33
3	Nuplains	4059	28	4623	5	3717	29	4487	24	3494	25	3172	20
4	Nekota	4066	27	4371	15	3172	33	4436	27	2512	34	2567	34
5	G980172W	4335	13	4496	9	3829	25	4521	23	3581	22	3385	12
6	G980723	4298	14	4475	10	4142	9	4980	13	4066	8	3379	13
7	G980926 W	4165	21	4455	11	4036	14	5098	9	4627	2	2384	35
8	NW97S412-1	3880	30	4536	7	3937	21	4998	12	4087	7	2726	30
9	NW97S142-1	4158	22	4593	6	3721	28	4446	26	3395	28	3321	16
10	NW97S139-1	4069	26	4052	25	4058	12	4766	22	3642	20	3767	3
11	NW97S139-2	4115	24	3944	27	3991	18	4860	19	4088	6	3026	26
12	NW99L7068	4432	3	4301	17	4402	2	5573	3	4263	4	3370	14
13	NW99L7083	4373	8	3901	30	4584	1	5735	2	4310	3	3708	4
14	NW99L7171	3794	32	3837	31	3875	22	4343	30	3801	18	3481	7
15	NW98S097	3795	31	4233	20	3983	19	5016	11	3630	21	3304	17
16	NW97S218-lt	4033	29	3833	32	4018	16	4932	15	4020	12	3102	22
17	NE99495	4227	16	4808	3	3426	30	4190	32	3473	26	2616	32
18	NI01808	4215	17	3635	34	4321	3	4891	16	4792	1	3280	18
19	NI01824	4356	11	3705	33	4163	8	5510	5	4032	11	2948	28
20	NE99464	4171	20	4156	23	3943	20	4890	17	3962	15	2978	27
21	NE99489	4364	9	4331	16	3857	23	4775	21	3348	30	3449	9
22	NE00658	4181	19	4243	19	3846	24	4332	31	3974	14	3231	19
23	NE00679	4356	10	4190	22	4242	7	4831	20	3884	17	4011	1
24	MT9426	3785	33	4509	8	3400	32	3410	35	3581	22	3115	21
25	SD97049	4133	23	3389	35	3790	26	5035	10	3562	24	2773	29
26	SD97250	4082	25	4412	14	3423	31	4361	29	2866	32	3043	24
27	SD98102	4406	5	4855	2	4307	4	4941	14	4182	5	3797	2
28	SD96306	4388	7	4287	18	4112	11	5893	1	3367	29	3076	23
29	SD97380-2	4484	1	3917	28	4291	5	5531	4	3760	19	3580	6
30	SD97394-1	4394	6	4963	1	4058	13	4462	25	4017	13	3695	5
31	SD98243	4346	12	4052	25	4128	10	4876	18	4055	9	3453	8
32	SD97250-2	4207	18	4449	12	3745	27	4379	28	3467	27	3388	11
33	SD97059-2	4458	2	4654	4	4034	15	5426	6	3345	31	3332	15
34	SD97W609	4271	15	3907	29	4017	17	5376	8	4035	10	2642	31
35	SD97W650	4410	4	4059	24	4245	6	5420	7	3921	16	3394	10
	mean	4158		4229		3912		4811		3716		3204	
	cv (%)	12.9		10.7		14.7		13.6		12.7		18.3	
	l.s.d. (0.05)	365		905		683		1065		769		ns	

Table 4. Mean grain yields (kg/ha) and ranks for 35 wheats grown in the 2003 NRPN.

		region		South Dakota state		Brookings, SD		Winner, SD		Dakota Lakes, SD	
Entry	Line or selection	mean	rank	mean	rank	mean	rank	mean	rank	mean	rank
1	Kharkof	3209	35	2255	35	3339	35	2389	35	1036	35
2	Roughrider	3501	34	2698	34	4060	34	2884	33	1149	34
3	Nuplains	4059	28	3224	29	5267	14	2844	34	1562	31
4	Nekota	4066	27	3477	12	5286	13	3334	7	1812	13
5	G980172W	4335	13	3922	1	6416	1	3206	18	2144	2
6	G980723	4298	14	3638	6	5159	21	3783	2	1971	4
7	G980926 W	4165	21	3784	2	4971	27	4033	1	2348	1
8	NW97S412-1	3880	30	3292	26	4796	30	3252	15	1828	11
9	NW97S142-1	4158	22	3642	5	6240	2	3002	27	1685	23
10	NW97S139-1	4069	26	3142	32	4649	32	2981	30	1797	15
11	NW97S139-2	4115	24	3359	21	4905	29	3206	19	1965	6
12	NW99L7068	4432	3	3370	20	5137	22	3160	21	1812	12
13	NW99L7083	4373	8	3322	23	5036	25	3344	6	1588	29
14	NW99L7171	3794	32	3464	14	5559	9	2951	32	1884	9
15	NW98S097	3795	31	3460	15	5557	10	3247	16	1577	30
16	NW97S218-lt	4033	29	3347	22	5088	23	3283	13	1669	26
17	NE99495	4227	16	3465	13	5291	12	3257	14	1848	10
18	NI01808	4215	17	3313	25	5047	24	3124	22	1766	19
19	NI01824	4356	11	3131	33	4312	33	3303	10	1777	16
20	NE99464	4171	20	3390	18	5208	17	3313	9	1649	27
21	NE99489	4364	9	3737	3	6106	3	3431	4	1675	25
22	NE00658	4181	19	3381	19	5565	8	2966	31	1613	28
23	NE00679	4356	10	3200	30	4960	28	3094	23	1547	32
24	MT9426	3785	33	3162	31	4758	31	2981	29	1746	21
25	SD97049	4133	23	3246	28	5205	18	3318	8	1215	33
26	SD97250	4082	25	3320	24	5198	20	2987	28	1777	16
27	SD98102	4406	5	3518	10	5209	16	3400	5	1945	7
28	SD96306	4388	7	3485	11	5672	5	3007	26	1777	16
29	SD97380-2	4484	1	3579	8	5510	11	3216	17	2011	3
30	SD97394-1	4394	6	3264	27	5014	26	3022	25	1756	20
31	SD98243	4346	12	3585	7	5643	6	3298	11	1812	13
32	SD97250-2	4207	18	3447	17	5199	19	3175	20	1967	5
33	SD97059-2	4458	2	3685	4	5846	4	3293	12	1914	8
34	SD97W609	4271	15	3563	9	5251	15	3711	3	1726	22
35	SD97W650	4410	4	3448	16	5590	7	3073	24	1680	24
	mean	4158		3380		5201		3196		1744	
	cv (%)	12.9		12		11.2		10.1		12.8	
	l.s.d. (0.05)	365		537		954		528		363	

Table 4. Mean grain yields (kg/ha) and ranks for 35 wheats grown in the 2003 NRPN.

		region		North Dakota State		Williston, ND		Casselton, ND		Hettinger, ND	
Entry	Line or selection	mean	rank	mean	rank	mean	rank	mean	rank	mean	rank
1	Kharkof	3209	35	3129	23	3327	11	3276	25	2670	24
2	Roughrider	3501	34	3521	7	3882	1	3908	8	2524	29
3	Nuplains	4059	28	3279	16	3284	12	3541	17	2923	12
4	Nekota	4066	27	3179	20	3043	24	3506	19	2923	12
5	G980172W	4335	13	3155	22	2907	28	3864	10	2498	30
6	G980723	4298	14	3017	25	2908	27	3325	24	2750	20
7	G980926 W	4165	21	2324	33	2353	31	2782	31	1674	34
8	NW97S412-1	3880	30	1284	35	870	35	1087	35	2099	32
9	NW97S142-1	4158	22	2798	29	3111	21	2629	33	2604	25
10	NW97S139-1	4069	26	2748	30	2335	32	2911	30	3082	10
11	NW97S139-2	4115	24	2533	32	2220	33	2643	32	2803	19
12	NW99L7068	4432	3	3332	14	3203	14	3490	20	3295	5
13	NW99L7083	4373	8	3303	15	3133	17	3420	21	3414	3
14	NW99L7171	3794	32	2645	31	2671	30	3068	28	2046	33
15	NW98S097	3795	31	2170	34	2156	34	2057	34	2338	31
16	NW97S218-lt	4033	29	2868	28	2710	29	3265	26	2551	28
17	NE99495	4227	16	3441	10	3128	20	3883	9	3268	6
18	NI01808	4215	17	3350	13	3784	3	3238	27	2923	14
19	NI01824	4356	11	3184	19	3132	18	3521	18	2803	18
20	NE99464	4171	20	3185	18	3377	9	3339	23	2723	22
21	NE99489	4364	9	3166	21	2968	26	3685	15	2737	21
22	NE00658	4181	19	2944	26	3041	25	3032	29	2697	23
23	NE00679	4356	10	3506	9	3609	4	3721	13	3082	11
24	MT9426	3785	33	3383	12	3807	2	3573	16	2564	27
25	SD97049	4133	23	3243	17	3044	23	3703	14	2896	15
26	SD97250	4082	25	3740	2	3552	5	4162	3	3428	2
27	SD98102	4406	5	3577	5	3332	10	4013	7	3321	4
28	SD96306	4388	7	3520	8	3220	13	4119	5	3122	9
29	SD97380-2	4484	1	3593	4	3186	15	4025	6	3560	1
30	SD97394-1	4394	6	3600	3	3406	8	4333	2	2883	16
31	SD98243	4346	12	3395	11	3141	16	3824	11	3162	7
32	SD97250-2	4207	18	3569	6	3550	6	4121	4	2856	17
33	SD97059-2	4458	2	3752	1	3432	7	4525	1	3149	8
34	SD97W609	4271	15	2903	27	3047	22	3800	12	1515	35
35	SD97W650	4410	4	3072	24	3131	19	3364	22	2604	26
	mean	4158		3125		3079		3450		2973	
	cv (%)	12.9		15.1		10.7		16.5		17.4	
	l.s.d. (0.05)	365		593		464		804		796	

Table 4. Mean grain yields (kg/ha) and ranks for 35 wheats grown in the 2003 NRPN.

		region		Montana State		Moccasin, MT		Bozeman, MT	
Entry	Line or selection	mean	rank	mean	rank	mean	rank	mean	rank
1	Kharkof	3209	35	3815	34	2226	34	5405	35
2	Roughrider	3501	34	3646	35	1825	35	5467	34
3	Nuplains	4059	28	5074	17	3147	9	7001	26
4	Nekota	4066	27	4858	30	3037	14	6678	32
5	G980172W	4335	13	5161	15	3206	6	7117	20
6	G980723	4298	14	5168	14	3096	11	7241	14
7	G980926 W	4165	21	5260	6	2957	17	7563	4
8	NW97S412-1	3880	30	5056	21	3017	15	7095	21
9	NW97S142-1	4158	22	5225	10	2793	26	7658	2
10	NW97S139-1	4069	26	5059	19	3046	13	7072	23
11	NW97S139-2	4115	24	5416	2	3412	5	7420	9
12	NW99L7068	4432	3	5554	1	3573	1	7534	5
13	NW99L7083	4373	8	5260	6	3096	11	7424	8
14	NW99L7171	3794	32	4580	33	2490	32	6669	33
15	NW98S097	3795	31	4706	32	2643	29	6770	31
16	NW97S218-lt	4033	29	4923	27	2916	19	6929	30
17	NE99495	4227	16	5260	8	3197	7	7324	11
18	NI01808	4215	17	4834	31	2609	30	7059	25
19	NI01824	4356	11	5036	22	2847	23	7225	15
20	NE99464	4171	20	5201	13	3194	8	7207	16
21	NE99489	4364	9	5008	23	2484	33	7532	6
22	NE00658	4181	19	5159	16	3120	10	7198	17
23	NE00679	4356	10	4922	28	2549	31	7294	12
24	MT9426	3785	33	4916	29	2898	21	6933	29
25	SD97049	4133	23	4942	26	2746	28	7137	19
26	SD97250	4082	25	5210	12	2845	24	7575	3
27	SD98102	4406	5	5059	19	2836	25	7283	13
28	SD96306	4388	7	5074	17	2990	16	7158	18
29	SD97380-2	4484	1	5262	5	3463	3	7061	24
30	SD97394-1	4394	6	5303	4	2777	27	7828	1
31	SD98243	4346	12	4959	25	2916	19	7001	26
32	SD97250-2	4207	18	5407	3	3430	4	7384	10
33	SD97059-2	4458	2	4980	24	2869	22	7090	22
34	SD97W609	4271	15	5229	9	3499	2	6958	28
35	SD97W650	4410	4	5225	10	2941	18	7510	7
	mean	4158		5021		2915		7108	
	cv (%)	12.9		7.8		12		6	
	l.s.d. (0.05)	365		598		571		697	

Table 4. Mean grain yields (kg/ha) and ranks for 35 wheats grown in the 2003 NRPN.

		region		Minnesota state		Rosemount, MN		Waseca, MN		Ames, IA		Lethbridge, Alberta	
Entry	Line or selection	mean	rank	mean	rank	mean	rank	mean	rank	mean	rank	mean	rank
1	Kharkof	3209	35	3536	35	2735	33	4338	34	4055	34	3314	35
2	Roughrider	3501	34	4623	31	3998	24	5248	31	4237	33	4056	34
3	Nuplains	4059	28	4917	28	4029	22	5806	29	4781	31	5852	22
4	Nekota	4066	27	5811	6	5160	3	6461	24	5622	23	5454	28
5	G980172W	4335	13	5691	10	4592	8	6790	12	6184	12	5281	30
6	G980723	4298	14	5497	17	3638	29	7356	7	5733	19	6232	9
7	G980926 W	4165	21	5344	21	2881	32	7808	2	5760	18	6643	2
8	NW97S412-1	3880	30	5590	14	3844	27	7336	8	6274	10	7187	1
9	NW97S142-1	4158	22	5382	20	4953	4	5811	28	5669	21	6119	13
10	NW97S139-1	4069	26	5441	18	4246	17	6636	16	5094	28	6331	7
11	NW97S139-2	4115	24	5641	13	4510	10	6771	13	5363	26	6186	12
12	NW99L7068	4432	3	5766	9	3970	25	7561	3	5686	20	6088	14
13	NW99L7083	4373	8	4932	27	2547	35	7316	9	6322	9	6586	3
14	NW99L7171	3794	32	4032	34	2676	34	5389	30	4936	29	5918	20
15	NW98S097	3795	31	4730	29	3432	31	6029	26	5545	25	5041	33
16	NW97S218-lt	4033	29	4978	26	4122	21	5834	27	5266	27	6056	17
17	NE99495	4227	16	5245	24	4308	15	6182	25	6086	13	6061	16
18	NI01808	4215	17	5281	22	4456	11	6518	21	5841	16	6062	15
19	NI01824	4356	11	6269	1	4229	18	8308	1	7250	2	6223	10
20	NE99464	4171	20	5241	25	4011	23	6472	23	5649	22	5642	27
21	NE99489	4364	9	5804	7	4566	9	7041	11	7055	3	6213	11
22	NE00658	4181	19	5822	5	5165	2	6479	22	5841	15	5735	24
23	NE00679	4356	10	6074	2	5402	1	6747	15	6429	8	5447	29
24	MT9426	3785	33	4191	33	4285	16	4097	35	2925	35	5172	32
25	SD97049	4133	23	5900	3	4721	7	7080	10	5952	14	5222	31
26	SD97250	4082	25	4494	32	3837	28	5151	32	4475	32	6040	19
27	SD98102	4406	5	5397	19	4198	19	6596	17	5780	17	5907	21
28	SD96306	4388	7	5658	12	4758	6	6559	18	6708	6	5722	25
29	SD97380-2	4484	1	5554	15	4348	12	6760	14	7011	4	6048	18
30	SD97394-1	4394	6	5252	23	3958	26	6546	19	6490	7	6390	6
31	SD98243	4346	12	5509	16	3581	30	7437	6	5599	24	6582	4
32	SD97250-2	4207	18	4671	30	4309	14	5034	33	4886	30	6268	8
33	SD97059-2	4458	2	5682	11	4831	5	6534	20	6244	11	5816	23
34	SD97W609	4271	15	5794	8	4124	20	7464	5	6873	5	5713	26
35	SD97W650	4410	4	5890	4	4314	13	7465	4	7253	1	6443	5
	mean	4158		5304		4135		6484		5739		5837	
	cv (%)	12.9		15.6		25.6		7.5		10		10	
	l.s.d. (0.05)	365		1602		ns		797		1179		924	

Table 5. Summary of mean yields of 35 wheats grown in the 2003 NRPN for three regional production zones (Peterson, 1992, Crop Science 32: 907).

		region		North Central Plains		Northern High Plains		Northern Plains	
Entry	Line or selection	mean	rank	mean	rank	mean	rank	mean	rank
1	Kharkof	3209	35	3286	35	only one location (Sidney) harvested		3017	25
2	Roughrider	3501	34	3780	33			3315	14
3	Nuplains	4059	28	4367	29			3276	17
4	Nekota	4066	27	4641	24			3256	18
5	G980172W	4335	13	4984	10			3279	15
6	G980723	4298	14	4921	13			3079	22
7	G980926 W	4165	21	4989	9			2307	33
8	NW97S412-1	3880	30	4874	16			1521	35
9	NW97S142-1	4158	22	4744	21			2619	32
10	NW97S139-1	4069	26	4547	28			2984	26
11	NW97S139-2	4115	24	4787	20			2712	30
12	NW99L7068	4432	3	5018	7			3406	12
13	NW99L7083	4373	8	4875	15			3417	11
14	NW99L7171	3794	32	4201	31			2630	31
15	NW98S097	3795	31	4591	27			2178	34
16	NW97S218-lt	4033	29	4618	25			2959	27
17	NE99495	4227	16	4614	26			3620	7
18	NI01808	4215	17	4824	19			3103	21
19	NI01824	4356	11	5179	3			3213	19
20	NE99464	4171	20	4743	22			3075	23
21	NE99489	4364	9	5095	4			3278	16
22	NE00658	4181	19	4856	18			2888	28
23	NE00679	4356	10	4980	11			3447	10
24	MT9426	3785	33	3759	34			3140	20
25	SD97049	4133	23	4933	12			3357	13
26	SD97250	4082	25	4107	32			3847	2
27	SD98102	4406	5	4857	17			3716	4
28	SD96306	4388	7	5059	6			3692	6
29	SD97380-2	4484	1	5070	5			3826	3
30	SD97394-1	4394	6	4702	23			3712	5
31	SD98243	4346	12	4893	14			3540	9
32	SD97250-2	4207	18	4323	30			3579	8
33	SD97059-2	4458	2	5016	8			3935	1
34	SD97W609	4271	15	5181	2			2820	29
35	SD97W650	4410	4	5193	1			3038	24
	mean	4158		4702				3164	
	cv (%)	12.9		13.5				17	
	l.s.d. (0.05)	365		587				837	

Table 5. Summary of mean yields of 35 wheats grown in the 2003 NRPN for three regional production zones (Peterson, 1992, Crop Science 32: 907).

		region		Northwest Plains		Northwest	
Entry	Line or selection	mean	rank	mean	rank	mean	rank
1	Kharkof	3209	35	2345	28	3648	35
2	Roughrider	3501	34	2710	8	3783	34
3	Nuplains	4059	28	2546	18	5333	22
4	Nekota	4066	27	2515	19	5056	29
5	G980172W	4335	13	2598	14	5201	27
6	G980723	4298	14	2506	21	5523	12
7	G980926 W	4165	21	2351	27	5721	3
8	NW97S412-1	3880	30	1281	35	5766	1
9	NW97S142-1	4158	22	2500	22	5523	11
10	NW97S139-1	4069	26	2105	33	5483	15
11	NW97S139-2	4115	24	2111	32	5673	6
12	NW99L7068	4432	3	2607	12	5732	2
13	NW99L7083	4373	8	2471	24	5702	4
14	NW99L7171	3794	32	2334	29	5026	31
15	NW98S097	3795	31	1908	34	4818	33
16	NW97S218-lt	4033	29	2264	30	5301	23
17	NE99495	4227	16	2579	15	5527	9
18	NI01808	4215	17	2919	2	5243	26
19	NI01824	4356	11	2551	17	5432	16
20	NE99464	4171	20	2636	11	5348	20
21	NE99489	4364	9	2414	26	5410	17
22	NE00658	4181	19	2429	25	5351	19
23	NE00679	4356	10	2725	7	5097	28
24	MT9426	3785	33	2923	1	5001	32
25	SD97049	4133	23	2260	31	5035	30
26	SD97250	4082	25	2791	4	5486	14
27	SD98102	4406	5	2738	6	5342	21
28	SD96306	4388	7	2601	13	5290	24
29	SD97380-2	4484	1	2683	10	5524	10
30	SD97394-1	4394	6	2699	9	5665	7
31	SD98243	4346	12	2572	16	5500	13
32	SD97250-2	4207	18	2872	3	5694	5
33	SD97059-2	4458	2	2782	5	5259	25
34	SD97W609	4271	15	2480	23	5390	18
35	SD97W650	4410	4	2509	20	5631	8
	mean	4158		2494		5300	
	cv (%)	12.9		12		9	
	l.s.d. (0.05)	365		950		574	

Table 6. Summary of mean volume weights (kg/hl) of 35 wheats grown in the 2003 NRPN.

Entry	Line or selection	region	Dakota Lakes, SD	Winner, SD	Brookings, SD	Casselton, ND	Williston, ND	Hettinger, ND
1	Kharkof	77.5	77.4	78.0	76.8	77.4	78.5	75.5
2	Roughrider	77.3	75.6	78.0	78.6	77.9	79.3	74.4
3	Nuplains	77.9	75.6	78.0	80.2	76.6	78.2	74.5
4	Nekota	76.1	70.8	73.2	78.3	76.1	79.8	76.1
5	G980172W	77.5	75.6	76.8	78.8	73.9	79.5	75.3
6	G980723	77.3	72.6	76.8	79.1	74.3	78.5	77.6
7	G980926 W	75.0	70.8	75.6	76.8	71.4	77.0	70.1
8	NW97S412-1	72.0	67.8	72.0	77.3	53.5	75.4	68.1
9	NW97S142-1	78.5	78.6	79.9	81.6	74.5	79.4	76.2
10	NW97S139-1	73.1	66.6	69.6	75.0	70.6	78.8	73.6
11	NW97S139-2	74.3	66.6	70.8	77.5	71.9	79.9	73.6
12	NW99L7068	73.3	64.1	69.0	76.2	71.3	81.7	74.2
13	NW99L7083	72.4	62.3	69.0	75.5	71.0	80.8	73.5
14	NW99L7171	75.2	76.2	74.4	76.0	70.0	75.9	69.8
15	NW98S097	75.2	72.0	75.0	78.3	68.7	76.9	73.4
16	NW97S218-lt	75.2	72.0	76.2	75.6	72.4	75.5	74.5
17	NE99495	74.7	70.2	73.2	76.7	74.5	79.6	73.9
18	NI01808	69.6	64.1	67.8	68.4	68.7	77.3	67.5
19	NI01824	76.9	70.8	76.2	80.4	75.1	80.2	73.3
20	NE99464	76.7	70.8	74.4	78.6	75.8	80.5	75.5
21	NE99489	75.2	71.4	74.4	79.0	72.2	78.1	71.6
22	NE00658	73.7	67.2	70.2	78.8	72.7	77.2	71.0
23	NE00679	71.4	64.1	69.0	73.3	70.1	78.2	69.1
24	MT9426	70.9	72.0	70.2	69.7	69.3	75.3	66.7
25	SD97049	74.6	70.8	74.4	77.3	72.2	79.0	73.7
26	SD97250	75.0	70.8	73.2	79.0	74.8	80.4	72.6
27	SD98102	76.1	75.0	76.2	76.8	75.0	77.0	72.3
28	SD96306	75.5	72.6	75.0	78.5	74.3	77.6	73.5
29	SD97380-2	74.8	70.8	73.2	77.7	73.4	78.3	73.6
30	SD97394-1	74.4	72.0	73.8	76.0	74.0	77.2	72.1
31	SD98243	74.8	69.6	72.6	77.6	74.0	77.9	72.7
32	SD97250-2	74.7	70.8	73.2	78.5	72.9	79.9	73.0
33	SD97059-2	74.8	72.0	75.0	76.9	74.7	77.2	71.8
34	SD97W609	75.4	69.0	73.2	79.1	74.2	80.0	73.0
35	SD97W650	75.7	69.0	71.4	78.9	74.2	80.2	73.9
		74.9	70.8	73.7	77.2	72.7	78.5	72.9

Table 6. Summary of mean volume weights (kg/hl) of 35 wheats grown in the 2003 NRPN.

Entry	Line or selection	region	Rosemount, MN	Waseca, MN	Moccasin, MT	Bozeman, MT	Ames, IA
1	Kharkof	77.5	78.9	79.1	73.7	78.3	79.2
2	Roughrider	77.3	79.7	78.9	70.1	78.3	79.2
3	Nuplains	77.9	81.7	77.8	76.8	80.0	77.3
4	Nekota	76.1	79.5	75.3	71.9	78.6	77.7
5	G980172W	77.5	80.0	76.9	77.2	79.8	78.7
6	G980723	77.3	79.7	78.9	75.2	79.0	78.3
7	G980926 W	75.0	79.3	76.6	71.9	77.6	78.2
8	NW97S412-1	72.0	80.0	76.2	69.3	76.1	76.2
9	NW97S142-1	78.5	83.7	78.0	73.3	78.9	79.4
10	NW97S139-1	73.1	77.3	73.5	69.5	77.3	72.8
11	NW97S139-2	74.3	78.6	74.8	70.4	79.1	74.6
12	NW99L7068	73.3	74.4	71.7	71.2	78.5	73.7
13	NW99L7083	72.4	72.9	71.5	67.7	77.9	74.4
14	NW99L7171	75.2	81.1	78.0	70.2	78.1	77.7
15	NW98S097	75.2	81.5	75.1	70.3	77.9	78.6
16	NW97S218-lt	75.2	79.3	75.6	72.3	77.6	76.2
17	NE99495	74.7	76.4	72.4	72.0	78.0	74.7
18	NI01808	69.6	75.5	72.0	60.4	71.6	72.4
19	NI01824	76.9	79.5	78.6	73.9	78.2	79.3
20	NE99464	76.7	80.8	76.0	73.7	79.2	77.9
21	NE99489	75.2	80.4	77.8	67.7	76.8	77.7
22	NE00658	73.7	78.2	75.5	68.5	76.4	75.1
23	NE00679	71.4	74.8	73.8	66.8	73.7	72.7
24	MT9426	70.9	77.7	69.8	66.2	73.5	69.9
25	SD97049	74.6	76.6	73.5	71.0	77.7	74.3
26	SD97250	75.0	76.9	73.3	71.9	77.4	74.3
27	SD98102	76.1	80.9	77.7	72.4	77.5	76.6
28	SD96306	75.5	76.9	77.7	71.8	76.4	76.0
29	SD97380-2	74.8	75.5	75.5	73.2	76.6	75.1
30	SD97394-1	74.4	76.6	74.9	69.6	76.9	75.1
31	SD98243	74.8	78.9	76.0	70.8	77.2	75.9
32	SD97250-2	74.7	76.6	72.5	73.5	77.4	73.7
33	SD97059-2	74.8	78.4	76.4	70.0	75.2	74.8
34	SD97W609	75.4	77.3	75.3	74.2	78.2	76.0
35	SD97W650	75.7	78.0	76.9	73.5	79.5	77.3
		74.9	78.4	75.5	71.2	77.4	76.0

Table 7. Summary of mean plant heights (cm) of 35 wheats grown in the 2003 NRPN.

Entry	Line or selection	Region	Lincoln, NE	Brookings, SD	Dakota Lakes, SD	Casselton, ND	Williston, ND	Hettinger, ND	Rosemount, MN	Moccasin, MT	Bozeman, MT	Ames, IA	Lethbridge, Alberta
1	Kharkof	105	118	107	28	105	100	98	146	108	119	131	102
2	Roughrider	99	113	107	30	99	92	85	129	99	108	127	100
3	Nuplains	78	90	91	24	74	68	73	89	84	85	101	81
4	Nekota	80	94	89	25	76	70	71	95	87	85	102	83
5	G980172W	76	90	84	26	75	71	71	87	88	83	96	70
6	G980723	74	87	84	29	69	66	68	86	81	79	95	74
7	G980926 W	75	91	89	27	68	69	65	84	81	84	94	77
8	NW97S412-1	75	88	89	27	63	63	68	86	80	83	95	80
9	NW97S142-1	76	90	89	21	71	68	64	91	79	85	100	81
10	NW97S139-1	77	94	86	23	70	64	68	90	80	83	105	80
11	NW97S139-2	75	91	91	26	67	66	67	86	81	79	98	74
12	NW99L7068	77	91	84	27	69	66	69	88	86	81	105	78
13	NW99L7083	76	90	89	26	67	65	65	85	85	81	104	76
14	NW99L7171	89	109	81	33	80	80	84	100	102	100	117	97
15	NW98S097	78	93	91	30	69	68	71	89	80	89	102	75
16	NW97S218-lt	80	97	97	29	77	69	69	91	85	86	100	76
17	NE99495	80	96	94	27	74	72	72	93	87	85	104	79
18	NI01808	81	91	97	26	78	71	77	94	82	87	103	85
19	NI01824	80	95	89	30	69	65	73	88	91	82	114	81
20	NE99464	82	92	104	22	76	77	78	96	85	90	105	80
21	NE99489	86	102	102	27	81	79	78	101	87	93	113	83
22	NE00658	85	100	104	25	74	74	74	102	94	92	109	83
23	NE00679	84	99	102	28	77	80	77	100	86	89	108	79
24	MT9426	82	95	97	24	83	74	72	101	84	91	106	78
25	SD97049	79	94	94	23	75	78	67	93	84	83	99	76
26	SD97250	86	102	104	24	80	81	78	96	89	92	113	86
27	SD98102	86	101	104	28	80	77	82	102	91	90	113	84
28	SD96306	87	102	89	29	85	79	77	109	91	96	115	84
29	SD97380-2	87	104	104	27	81	76	82	104	89	92	115	86
30	SD97394-1	89	103	99	31	85	82	85	106	91	96	113	86
31	SD98243	81	91	94	28	77	74	77	94	87	87	104	81
32	SD97250-2	87	102	102	26	83	77	81	102	91	93	113	83
33	SD97059-2	88	100	102	28	85	79	85	109	88	96	115	80
34	SD97W609	75	88	94	29	67	65	65	87	82	78	98	70
35	SD97W650	79	97	97	29	69	65	68	93	84	85	102	77
		82	97	95	27	76	73	74	97	87	89	106	81

Table 8. Summary of days (from 1/1) to heading for 35 wheats grown in the 2003 NRPN.

Entry	Line or selection	region	Lincoln, NE	Brookings, SD	Winner, SD	Casselton, ND	Williston, ND	Hettinger, ND	Bozeman, MT	Moccasin, MT	Rosemount, MN	Ames, IA	Lethbridge, Alberta
1	Kharkof	163	150	164	157	173	164	172	169	166	158	153	171
2	Roughrider	163	151	164	157	174	164	172	169	166	158	152	172
3	Nuplains	162	150	162	154	171	165	172	167	167	158	152	170
4	Nekota	158	144	156	149	169	157	167	163	167	154	148	163
5	G980172W	161	148	161	153	171	161	170	167	166	158	150	170
6	G980723	160	147	159	153	171	160	169	164	166	158	149	165
7	G980926 W	159	140	159	152	171	159	168	164	166	158	147	166
8	NW97S412-1	161	146	160	153	170	160	169	165	168	158	149	168
9	NW97S142-1	162	150	162	154	172	164	172	167	167	158	152	169
10	NW97S139-1	159	145	160	152	170	159	168	164	167	154	149	166
11	NW97S139-2	159	146	158	152	168	159	168	163	166	156	149	165
12	NW99L7068	156	141	153	148	168	159	166	160	165	154	144	163
13	NW99L7083	156	141	153	148	168	157	166	161	166	154	144	162
14	NW99L7171	162	149	162	155	170	162	172	167	166	159	150	169
15	NW98S097	161	146	161	152	172	161	171	167	167	158	149	169
16	NW97S218-lt	162	149	162	154	171	163	171	166	167	161	151	168
17	NE99495	159	144	156	152	170	159	169	163	165	154	148	165
18	NI01808	162	146	162	154	172	163	172	166	168	159	151	170
19	NI01824	157	141	159	148	168	157	167	162	166	154	145	164
20	NE99464	161	145	160	153	171	160	170	165	167	158	149	169
21	NE99489	160	148	159	153	171	161	170	164	165	158	150	167
22	NE00658	161	148	159	152	171	161	171	165	166	157	149	167
23	NE00679	160	148	159	152	170	160	168	164	166	157	150	168
24	MT9426	164	150	163	156	173	165	173	169	169	160	152	171
25	SD97049	158	145	156	151	169	158	169	163	164	154	148	164
26	SD97250	161	147	159	151	171	161	169	165	167	159	150	169
27	SD98102	161	149	160	153	171	161	171	165	166	158	150	169
28	SD96306	161	147	160	153	172	162	170	165	166	158	150	167
29	SD97380-2	160	145	158	152	170	161	168	164	166	157	149	166
30	SD97394-1	160	147	159	152	171	162	169	164	166	158	149	166
31	SD98243	159	145	158	151	170	158	168	163	166	154	149	164
32	SD97250-2	161	147	159	152	171	161	171	165	166	158	150	167
33	SD97059-2	162	149	160	153	172	162	171	166	166	158	150	170
34	SD97W609	158	141	156	149	168	158	167	163	166	155	147	167
35	SD97W650	158	142	158	149	168	157	167	163	166	154	147	166
		160	146	159	152	170	160	169	165	166	157	149	167

Table 9. Stability analyses, grain yield and volume weights, of 35 wheats grown in the 2003 NRPN.

		grain yield			volume weight		
Entry	Line or selection	regional average (kg/ha)	regression coef. (b)	r^2	regional average (kg/hl)	regression coef. (b)	r^2
1	Kharkof	3209	0.57	0.70	77.5	0.40	0.38
2	Roughrider	3501	0.68	0.75	77.3	0.77	0.57
3	Nuplains	4059	0.90	0.95	77.9	0.60	0.64
4	Nekota	4066	0.95	0.90	76.1	0.99	0.83
5	G980172W	4335	1.00	0.93	77.5	0.60	0.69
6	G980723	4298	1.05	0.96	77.3	0.72	0.78
7	G980926 W	4165	1.20	0.86	75.0	1.05	0.80
8	NW97S412-1	3880	1.30	0.84	72.0	1.84	0.50
9	NW97S142-1	4158	1.07	0.92	78.5	0.76	0.52
10	NW97S139-1	4069	0.99	0.94	73.1	1.25	0.85
11	NW97S139-2	4115	1.05	0.94	74.3	1.41	0.90
12	NW99L7068	4432	1.06	0.96	73.3	1.36	0.65
13	NW99L7083	4373	1.11	0.89	72.4	1.50	0.70
14	NW99L7171	3794	0.92	0.89	75.2	0.95	0.50
15	NW98S097	3795	1.01	0.92	75.2	1.20	0.76
16	NW97S218-lt	4033	0.96	0.97	75.2	0.69	0.71
17	NE99495	4227	0.98	0.95	74.7	0.85	0.73
18	NI01808	4215	0.98	0.93	69.6	1.51	0.77
19	NI01824	4356	1.20	0.90	76.9	1.06	0.87
20	NE99464	4171	0.99	0.99	76.7	1.03	0.90
21	NE99489	4364	1.19	0.96	75.2	1.31	0.86
22	NE00658	4181	1.02	0.95	73.7	1.35	0.91
23	NE00679	4356	1.00	0.92	71.4	1.35	0.89
24	MT9426	3785	0.62	0.60	70.9	0.84	0.47
25	SD97049	4133	1.07	0.94	74.6	0.87	0.91
26	SD97250	4082	0.86	0.83	75.0	0.85	0.76
27	SD98102	4406	0.94	0.97	76.1	0.69	0.63
28	SD96306	4388	1.05	0.94	75.5	0.71	0.82
29	SD97380-2	4484	1.00	0.94	74.8	0.71	0.82
30	SD97394-1	4394	1.07	0.95	74.4	0.79	0.87
31	SD98243	4346	1.05	0.95	74.8	1.07	0.95
32	SD97250-2	4207	0.83	0.87	74.7	0.86	0.70
33	SD97059-2	4458	0.99	0.94	74.8	0.79	0.77
34	SD97W609	4271	1.13	0.90	75.4	1.01	0.80
35	SD97W650	4410	1.22	0.97	75.7	1.16	0.83

Table 10. Reaction of 35 wheats grown in the 2003 NRPN to WSBMV Hessian fly.

Entry	Line or selection	Wheat soilborne mosaic virus (WSBMV) [1]Stillwater, OK	Hessian fly2 rating
1	Kharkof	3 (MS)	S
2	Roughrider	3 (MS)	S
3	Nuplains	3 (MS)	S
4	Nekota	3 (MS)	S
5	G980172W	2 (MR)	S
6	G980723	1 [R]	S
7	G980926 W	1 {[R]	S
8	NW97S412-1	4 (S)	S
9	NW97S142-1	4 (S)	S
10	NW97S139-1	4 (S)	S
11	NW97S139-2	4 (S)	S
12	NW99L7068	3 (MS)	S
13	NW99L7083	3 (MS)	S
14	NW99L7171	1 [R]	S
15	NW98S097	2 (MR)	H
16	NW97S218-lt	1 [R]	S
17	NE99495	4 (S)	H
18	NI01808	2/3 (MR/MS)	S
19	NI01824	3/2 (MS/MR)	H
20	NE99464	3/2 (MS/MR)	S
21	NE99489	3/2 (MS/MR)	H-
22	NE00658	3/2 (MS/MR)	S
23	NE00679	4 (S)	H
24	MT9426	4 (S)	S
25	SD97049	4 (S)	H
26	SD97250	4 (S)	R
27	SD98102	3 (MS)	H-
28	SD96306	4 (S)	R-
29	SD97380-2	4 (S)	H
30	SD97394-1	3 (MS)	H
31	SD98243	4 (S)	H-
32	SD97250-2	4 (S)	H+
33	SD97059-2	3 (MS)	H-
34	SD97W609	3 (MS)	S
35	SD97W650	3/2 (MS/MR)	H

[1]Visual assessment of WSBMV symptoms in the field:1=no mosaic, no stunting (resistant), 2=slight mosaic and/or slight stunting (moderately resistant), 3=moderate mosaic and/or moderate stunting (moderately susceptible), 4=severe mosaic and/or severe stunting (susceptible). From Bob Hunger, Oklahoma State University.

[2]R = resistant, S = susceptible, H = heterogeneous. From Elburn Parker, USDA-ARS, Manhattan, KS.

Table 11. Field reactions of 35 wheats grown in the 2003 NRPN to foliar diseases.

Entry	Line or selection	Seedling leaf rust, Stillwater, OK[1]	Leaf rust, adult plant, Brookings, SD	Leaf rust, adult plant reaction, St. Paul, MN	Stem rust, adult plant reaction, St. Paul, MN	Stripe rust, Corvallis, OR	Powdery mildew, Lethbridge, Alberta
1	Kharkof	3+ (S)	S	30 ms	40 ms	R	5
2	Roughrider	3+ (S)	S	20 ms	trace r	S	3
3	Nuplains	X;3 (MR)	R	10 mrms	10 r	S	7
4	Nekota	3+ (S)	S	30 mrms	20 mrms	S	5
5	G980172W	X;3- (MR)	R	60 s	5 r	S	8
6	G980723	X;3-c (MR)	MS	5 rmr	50 mss	MS	4
7	G980926 W	3+ (S)	MR	30 ms	60 mss	S	1
8	NW97S412-1	X;3c (MR)	R	5 mr	trace r	R	3
9	NW97S142-1	X;3 (MR)	R	10 mr	5 r	S	9
10	NW97S139-1	3+ (S)	S	10 mrms	5 mr	R	6
11	NW97S139-2	3+ (S)	S	20 mrms	5 r	R	4
12	NW99L7068	3+c (S)	S	50 ms	60 mss	S	6
13	NW99L7083	3+ (S)	S	30 ms	60 mss	S	6
14	NW99L7171	X;3= (MR)	R	5 mrms	5 r	S	4
15	NW98S097	X;3 (MR)	R	10 mr	10 mr	S	5
16	NW97S218-lt	3+ (S)	MS	trace r	10 mrms	R	4
17	NE99495	3 (S)	MS	20 mr	30 mrms	S	6
18	NI01808	3+ (S)	MS	10 mrms	40 mss	MS-S	5
19	NI01824	3- (S)	MS	20 mrms	30 mrms	S-MS	5
20	NE99464	4 (S)	S	30 mrms	20 mrms	MS-S	7
21	NE99489	X;3 (MR)	R	5 mrms	5 r/30 ms	MS-S	4
22	NE00658	3+ (S)	MS	10 mrms	30 mss	MS-S	5
23	NE00679	X;3c (MR)	MS	10 mrms	10 mr	MS-SEG	4
24	MT9426	3+ (S)	MS	40 ms-s	40 mss	S	4
25	SD97049	X3; (S)	R	20 mrms	20 mrms	S	7
26	SD97250	X;3- (MR)	R	30 mr	trace r	S	6
27	SD98102	3+ (S)	S	20 mrms	5 r	S	2
28	SD96306	X;3= (MR)	R	20 mr	5 rmr	MS	4
29	SD97380-2	X;3= (MR)	R	10-20 mr	5 rmr	S	6
30	SD97394-1	3-c (MS)	MR	10 mr	10 mr	MS-S	6
31	SD98243	3+ (S)	S	20 mrms	30 mss	MS	2
32	SD97250-2	X;3-c (MR)	R	20 mrms	5 r	S	5
33	SD97059-2	X;3- (MR)	R	20 mr	10 mr	MS-MR	4
34	SD97W609	3+ (S)	MS	10 mrms	20 mr	S	5
35	SD97W650	3+ (S)	S	10 mr	30 mrms	MS-MR	7

[1]Seedling leaf rust reaction using a bulk mixture of Puccinia triticina spores collected from Oklahoma and Texas in spring, 2002.

Table 12. Reaction of 35 wheats in the 2003 NRPN to infection by Fusarium head blight, Brookings, SD (from Amir Ibrahim).

Entry	Line or selection	Inc%	Sev%	Dis%
1	Kharkof	76.7	30.2	23.8
2	Roughrider	55	17	9.4
3	Nuplains	96.7	55.8	54.6
4	Nekota	90	43.2	38.7
5	G980172W	88.9	41.4	37.1
6	G980723	93.3	41.8	39.6
7	G980926 W	84.4	34.8	30.2
8	NW97S412-1	88.3	45.3	42
9	NW97S142-1	88.3	40	36.3
10	NW97S139-1	93.3	56.7	53.4
11	NW97S139-2	91.7	59.5	55.5
12	NW99L7068	93	34.4	32.4
13	NW99L7083	85	25.8	22
14	NW99L7171	60	22	14.4
15	NW98S097	83.8	42.3	35.5
16	NW97S218-lt	90	29.8	26.9
17	NE99495	83.3	40.3	35
18	NI01808	81.7	42.7	35.1
19	NI01824	85	22	18.6
20	NE99464	83.3	39.3	34.2
21	NE99489	91.7	53.2	49
22	NE00658	98.3	63.3	62.5
23	NE00679	95	40.7	38.7
24	MT9426	91.7	33.3	31.1
25	SD97049	83.3	31.7	26.3
26	SD97250	70	21.5	15
27	SD98102	75	23.2	17.6
28	SD96306	78.3	24.3	21
29	SD97380-2	88.3	26.2	23.4
30	SD97394-1	91.7	37.5	34.9
31	SD98243	90	43.8	39.5
32	SD97250-2	73.3	23	16.8
33	SD97059-2	88.3	23.3	20.6
34	SD97W609	95	53.8	51.3
35	SD97W650	88.3	43.3	38.1

Scab ratings were based on 0-9 scale (0=absence of diseased spikelets; 9= all spikelets infected). Incidence (%) was calculated as the number of infected spikes, while severity (%) was calculated as the average of the scab ratings * 10. Disease index (%) was calculated as incidence * severity/100.

Table 13. Reaction of entries in the 2003 NRPN to selected isolates of stem rust (from Jim Kolmer, USDA-ARS, St. Paul, MN.) and 1RS status.

		stem rust races				
		01 TX 27C	74 MN 1409A	72 MEX 53-A	69 MN 399	
Entry	Line or selection	TTTT	TPMK	RTQQ	QTHJ	1RS status
1	Kharkof	3+4	4	3+4	3+4	Non.1RS
2	Roughrider	3+4	3+4	23	23	Non.1RS
3	Nuplains	2	22+	;12	;12	Non.1RS
4	Nekota	3	0;	;	23	1AL.1RS
5	G980172W	22-	2	22+	;12	Non.1RS
6	G980723	3+4	33+	2+3+	;12	Non.1RS
7	G980926 W	3+4	3+4	3+4	3+4	Non.1RS
8	NW97S412-1	0	12	;	;12-	1BL.1RS
9	NW97S142-1	12	22+	1	12	Non.1RS
10	NW97S139-1	3	0	0;	23	Non.1RS
11	NW97S139-2	0	0	0;	34	Non.1RS
12	NW99L7068	3+4	2+3+	4	34	Non.1RS
13	NW99L7083	3+4	3+4	3+4	3+4	Non.1RS
14	NW99L7171	22-	0;	;1-	22-	Non.1RS
15	NW98S097	2	2+	2++	22++	Non.1RS
16	NW97S218-lt	23+	23	0;	;1	Non.1RS
17	NE99495	33+	0;	;	34	Non.1RS
18	NI01808	0;2	2+3	;	34	Non.1RS
19	NI01824	2+3+	;1	;	2+3+	Non.1RS
20	NE99464	23	3+4	22-	22-	Non.1RS
21	NE99489	12-	;	0;	12-	Non.1RS
22	NE00658	23+	;	0;	23+	Non.1RS
23	NE00679	23+	;12-	0;	23+	Non.1RS
24	MT9426	23+	3+4	0;	23+	Non.1RS
25	SD97049	;1	;	33+	23	Non.1RS
26	SD97250	22+	;	;	;22-	Non.1RS
27	SD98102	2-	;	;	22+	1AL.1RS
28	SD96306	2-	;	;	2-	Non.1RS
29	SD97380-2	2+2-	;	;	22-	Non.1RS
30	SD97394-1	34	;	;	22+	Non.1RS
31	SD98243	34	;	;1-	23	Non.1RS
32	SD97250-2	22-	;	;	22-	Non.1RS
33	SD97059-2	2+	;	22-	22+	Non.1RS
34	SD97W609	33-	-	22+	22+	Non.1RS
35	SD97W650	33+	;22+	23	;22+	Non.1RS

Table 14. Seedling reactions to leaf rust of 35 lines grown in the 2003 NRPN (from Jim Kolmer, USDA-ARS, St. Paul, MN).

		Leaf rust races			
		99 ND 588	00 SD 520	99 GA 86-3	97 CAN 64 1
Entry	Line	THBJ	MCDS	TNRJ	KFBJ
1	Kharkof	33+	3+	-	33+
2	Roughrider	33+	3+	3+	33+
3	Nuplains	;	3+	3+	0;
4	Nekota	33+	;	;2	;0
5	G980172W	;	;	3+	;0
6	G980723	;	3+	3+	;
7	G980926 W	;	;	;2+	0;
8	NW97S412-1	33+	-	;1-	0;(3)
9	NW97S142-1	;	;	3	33+
10	NW97S139-1	33+	;1-	;	33+
11	NW97S139-2	33+	2-	22+	33+
12	NW99L7068	33+	3+	3+	33+
13	NW99L7083	33+	3+	3+	33+
14	NW99L7171	;	3+	;1+/3+	23
15	NW98S097	;	;1	;2	33+
16	NW97S218-lt	2-	3+	3+	;0(3)
17	NE99495	2-	;-	3+	33+
18	NI01808	;	3+	3+	;0
19	NI01824	;	;	-	2+
20	NE99464	33+	2-	2c-	33
21	NE99489	;	-	3+	33+
22	NE00658	33+	3+	3+	2
23	NE00679	33+	;2-	-	2-
24	MT9426	33+	3+	3+	33+
25	SD97049	33+	;1-	2c3-	22-
26	SD97250	33+/;	;	;2--	22-
27	SD98102	33+	3+	3+	;0
28	SD96306	;	;	;2-	;1-
29	SD97380-2	;	;	;2-	2-
30	SD97394-1	;1-	;1-	;2-	2-
31	SD98243	2	-	;2-3/3+	3+/22-
32	SD97250-2	;1-	;	;23	22-
33	SD97059-2	;	;	;23	;1-
34	SD97W609	33+	3+	3+	33+
35	SD97W650	33+	3+	2	33+

Table 15. Tolerance to acid soils, grain protein content, and winter survival of 35 wheats entered in the 2003 NRPN.

		Acid soil tolerance, Enid, OK (1-5, 1=tolerant)			Grain protein concentration (%)						
Entry	Line or selection	Nov. 11, 2002	Jan. 8, 2003	May 5, 2002	Hettinger, ND	Williston, ND	Rosemount, MN	Waseca, MN	Moccasin, MT	Bozeman, MT	mean
1	Kharkof	5	4	4	16.2	15.5	13.4	15.0	15.6	15.7	15.2
2	Roughrider	5	4	4	16.4	14.6	13.3	13.8	16.8	15.2	15.0
3	Nuplains	3	3	3	15.6	14.3	11.9	13.3	13.7	14.2	13.5
4	Nekota	5	5	4	14.2	14.7	11.8	12.3	14.9	14.4	13.6
5	G980172W	4	4	3	14.0	14.1	12.1	12.4	13.7	12.8	13.0
6	G980723	4	5	3	14.5	15.0	11.9	13.4	14.0	13.6	13.6
7	G980926 W	3	4	3	14.6	13.9	11.3	12.5	14.7	12.8	13.0
8	NW97S412-1	3	2	1	15.5	14.9	11.9	13.4	15.3	14.2	13.9
9	NW97S142-1	3	4	3	15.6	14.4	12.0	13.6	16.0	14.3	14.1
10	NW97S139-1	3	3	1	14.3	13.9	10.6	13.2	14.3	13.5	13.1
11	NW97S139-2	3	3	2	14.7	14.3	11.2	13.3	14.6	13.7	13.4
12	NW99L7068	2	3	3	13.4	13.0	10.6	12.2	14.2	12.7	12.5
13	NW99L7083	3	4	4	12.6	13.0	10.1	12.0	15.3	12.6	12.6
14	NW99L7171	3	3	2	15.8	13.7	12.5	14.5	16.2	14.3	14.2
15	NW98S097	5	4	4	15.8	14.3	10.9	13.5	15.7	14.3	13.7
16	NW97S218-lt	4	4	2	14.2	13.8	11.9	13.1	14.2	13.5	13.3
17	NE99495	4	4	3	15.0	14.8	10.1	12.5	13.7	14.2	13.1
18	NI01808	2	3	2	16.2	14.2	10.5	12.9	15.8	14.6	13.6
19	NI01824	1	1	1	14.5	13.9	10.0	13.2	13.8	13.5	12.9
20	NE99464	5	5	4	15.1	14.5	10.3	12.7	15.4	14.4	13.5
21	NE99489	5	5	4	15.1	13.9	11.3	13.6	16.3	14.0	13.8
22	NE00658	5	5	4	15.4	14.9	11.0	12.7	15.1	14.4	13.6
23	NE00679	2	3	2	15.3	13.4	10.0	12.4	15.2	13.8	13.0
24	MT9426	3	3	3	16.2	13.6	10.1	13.5	14.8	14.7	13.3
25	SD97049	4	4	4	14.6	14.5	10.0	12.4	14.0	14.5	13.1
26	SD97250	3	4	3	15.3	14.4	11.2	12.3	15.5	14.1	13.5
27	SD98102	4	4	3	14.9	14.2	11.2	13.2	14.8	13.7	13.4
28	SD96306	4	4	4	15.2	14.7	11.5	13.6	14.6	14.4	13.8
29	SD97380-2	4	4	4	15.0	14.2	11.5	13.4	15.2	14.3	13.7
30	SD97394-1	3	3	3	15.1	14.1	11.1	12.9	15.6	13.8	13.5
31	SD98243	4	4	4	13.8	14.2	11.1	12.3	14.8	13.5	13.2
32	SD97250-2	4	4	3	14.4	14.6	11.0	12.2	14.7	14.0	13.3
33	SD97059-2	3	4	3	15.5	14.3	11.4	13.8	15.1	14.2	13.8
34	SD97W609	4	4	3	14.1	14.5	10.5	12.7	14.4	13.7	13.2
35	SD97W650	3	3	2	14.3	14.4	10.6	12.4	14.3	13.6	13.1
	mean	4	4	3	16	14	11	13	15	14	13

Table 15. Tolerance to acid soils, grain protein content, and winter survival of 35 wheats entered in the 2003 NRPN.

		Winter survival (%)					
Entry	Line or selection	Brookings, SD	Winner, SD	Casselton, ND	Williston, ND	Hettinger, ND	mean
1	Kharkof	96	100	98	68	83	89
2	Roughrider	96	100	100	75	75	89
3	Nuplains	89	100	80	40	75	77
4	Nekota	89	100	83	45	80	79
5	G980172W	89	100	80	33	58	72
6	G980723	93	100	73	35	48	70
7	G980926 W	52	100	73	18	33	55
8	NW97S412-1	56	100	43	5	50	51
9	NW97S142-1	78	100	73	33	68	70
10	NW97S139-1	85	100	75	16	72	70
11	NW97S139-2	81	93	63	19	68	65
12	NW99L7068	89	100	78	39	87	78
13	NW99L7083	85	100	73	36	83	76
14	NW99L7171	59	100	78	15	60	62
15	NW98S097	78	89	68	15	60	62
16	NW97S218-lt	78	100	75	20	63	67
17	NE99495	89	93	85	41	78	77
18	NI01808	85	93	78	46	72	75
19	NI01824	89	100	78	31	67	73
20	NE99464	96	93	85	45	60	76
21	NE99489	74	100	85	30	58	69
22	NE00658	85	100	75	38	58	71
23	NE00679	100	100	85	49	73	81
24	MT9426	93	100	88	44	65	78
25	SD97049	89	100	83	44	68	77
26	SD97250	100	100	85	64	83	86
27	SD98102	93	100	90	39	75	79
28	SD96306	93	100	88	41	57	76
29	SD97380-2	96	100	90	39	81	81
30	SD97394-1	81	85	80	34	63	69
31	SD98243	81	100	83	39	70	75
32	SD97250-2	96	93	80	54	65	77
33	SD97059-2	100	100	90	53	72	83
34	SD97W609	96	100	85	48	30	72
35	SD97W650	93	100	80	44	60	75
	mean	86	98	80	38	66	74