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Small Grains and Field Peas: 2010 Variety Recommendations (2009 Crop Performance Results)

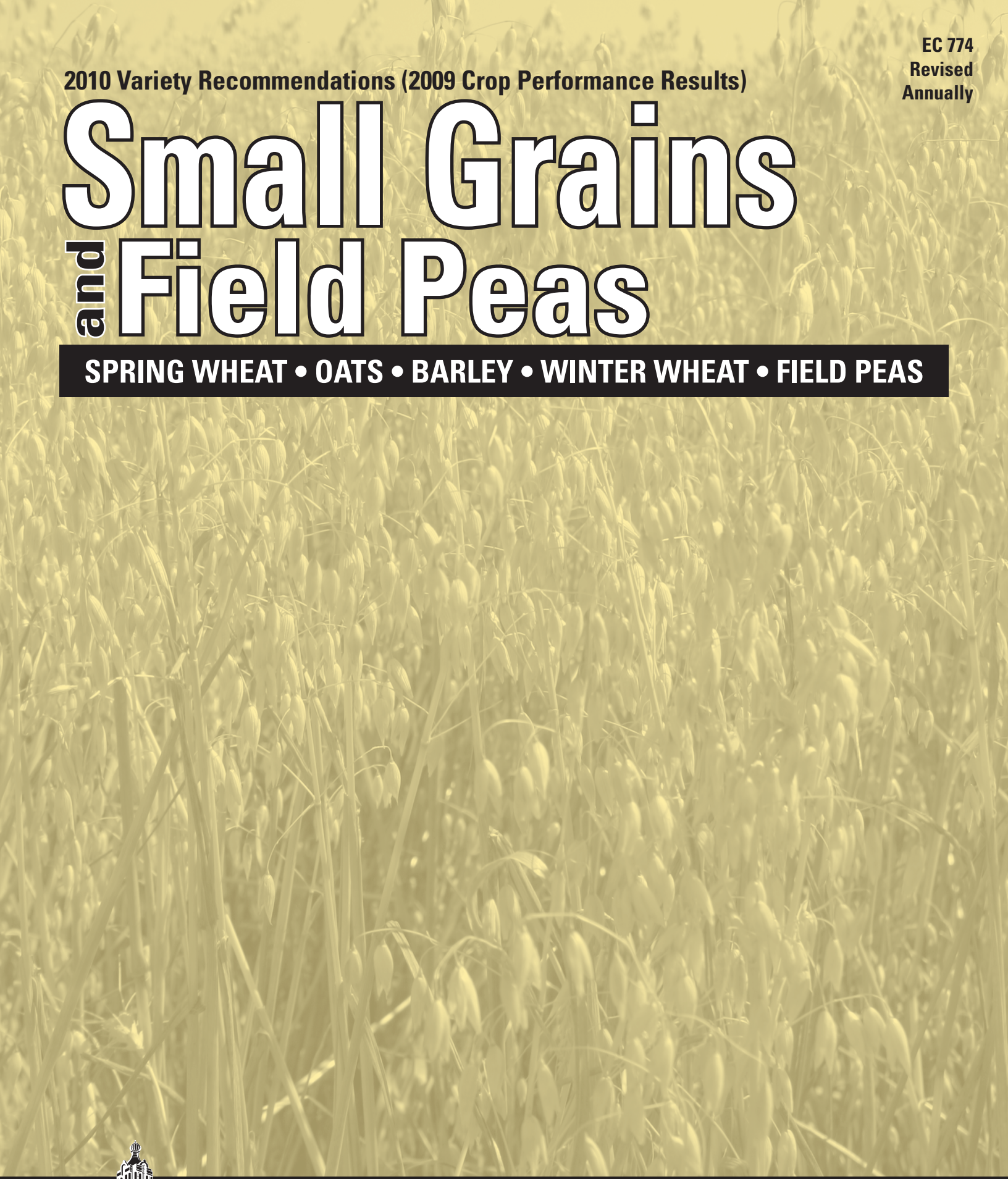
Cooperative Extension Service, South Dakota State University

EC 774
Revised
Annually

2010 Variety Recommendations (2009 Crop Performance Results)

Small Grains and Field Peas

SPRING WHEAT • OATS • BARLEY • WINTER WHEAT • FIELD PEAS



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The crop performance trials are available at http://plantsci.sdstate.edu/varietytrials/vartrial.html

Small Grain Variety Recommendations for 2010

Recommendations are based on information from the South Dakota Crop Performance Testing (CPT) Program and regional university trials. Variety performance depends on genetics and environmental factors like temperature, moisture, plant pests, soil fertility, soil type, and management practices. The performance of recommended varieties in response to environmental conditions is generally better than that of other varieties. The better performance of a recommended variety, however, cannot always be guaranteed due to its complex response to the environment. Variety recommendations, including crop adaptation area (CAA) where each is most suited, are listed below:

[PVP] Plant variety protection has been issued or is anticipated; seed sales are restricted to classes of certified seed.
[#PVP] Plant variety protection with non-title V status.
[#PVP/SLR] Plant variety protection with non-title V status and seed licensing requirements.

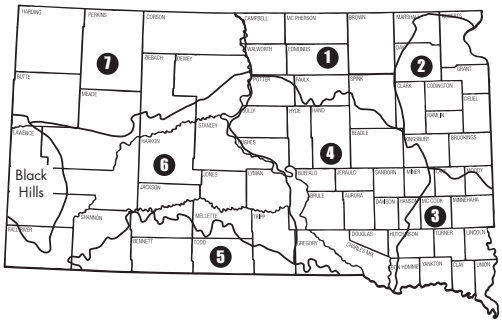
SPRING WHEAT			
Recommended		**Acceptable/Promising**	
Variety	**CAA**	**Variety**	**CAA**
Brick [PVP]	Statewide	Albany [PVP]	Statewide
Briggs [PVP]	All except 3	Glenn [PVP]	Statewide
Faller [PVP]	Statewide	Tom [PVP]	3, 4
Granger [PVP]	All except 3		
Howard [PVP]	Statewide		
RB07 [PVP]	All except 3		
Steele-ND [PVP]	All except 3		
Traverse [PVP]	Statewide		

OAT			
Recommended		**Acceptable/Promising**	
Variety	**CAA**	**Variety**	**CAA**
Beach[PVP]	5, 6, 7	Buff (hulless)	Statewide
Colt [PVP]	Statewide	Don	5, 6, 7
Souris [PVP,SLR]	Statewide	Hi Fi [#PVP]	1, 2, 7
Stallion [PVP]	Statewide	Jerry [#PVP]	5, 6, 7
		Reeves	5, 6, 7
		Rockford	1, 2, 7
		Streaker [PVP] (hulless)	Statewide

BARLEY			
Recommended		**Acceptable/Promising**	
Variety	**CAA**	**Variety**	**CAA**
Conlon [PVP]	1, 4, 6, 7	Drummond [PVP]	Statewide
Eslick - feed	6, 7		
Lacey [PVP]	Statewide		
Pinnacle [PVP]	1, 2, 7		
Rasmusson[# PVP/SLR]	Statewide		
Rawson [PVP]	1, 2, 7		

WINTER WHEAT			
Recommended		**Acceptable/Promising**	
Variety	**CAA**	**Variety**	**CAA**
Alice [PVP] (white)	1[pc], 4[pc], 5, 6, 7[pc]	Arapahoe [PVP]	1[pc], 3, 4[pc], 5, 6, 7[pc]
Expedition [PVP]	1[pc], 4, 5, 6, 7[pc]	Darrell [PVP]	1[pc], 4, 5, 6, 7[pc]
Harding [PVP]	1[pc], 2 [pc], 4, 7	Hatcher [PVP]	5, 6, 7[pc]
Millennium [PVP]	1[pc], 4 [pc], 5, 6, 7[pc]	Hawken [PVP]	3, 4[pc], 5, 6
NuDakota [PVP]	5, 6, 7[pc]	Lyman [PVP]	1[pc], 3, 4[pc], 5, 6, 7[pc]
Overland [PVP]	1[pc], 3, 4[pc], 5, 6, 7[pc]	Smoky Hill [PVP]	5, 6, 7[pc]
Wendy PVP (white)	5, 6, 7[pc]	Wesley	5, 6, 7[pc]

Crop Adaptation Areas for South Dakota (revised 1992)



American Malting Barley Assoc. approved malting varieties tested:

Conlon	Drummond
Lacey	Rasmusson
Stellar-ND	Robust

[pc] Plant into protective cover.

This report is available on the Web at http://www.sdstate.edu/~wpls/http/var/vartrial.html

EC 774-10: Access at http://agbiopubs.sdstate.edu/articles/EC774-10.pdf.

Small Grains and Field Peas

2009 South Dakota Test Results, Variety Traits, and Yield Averages

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Variety selection is a very important management decision in a sound crop production program. This report contains variety recommendations, descriptions, and yield data for the spring-seeded small grains—spring wheat, oat, and barley; fall-seeded winter wheat; and spring-seeded field peas.

Key factors in variety selection include yield, yield stability, maturity, straw strength, height, test weight, quality, and disease resistance. Yield is important; however, a variety with good disease resistance, straw strength, and high grain quality may be more profitable than a variety selected merely for its yield history.

Disease resistance is based on reactions to prevalent races of a disease. Since disease resistance changes over time, growers should inspect variety disease reactions annually and not assume they have not changed.

Variety Recommendations (inside cover)

The Plant Science Department Variety Recommendation Committee makes small grain variety recommendations annually. Recommendations for a crop may vary from one crop adaptation area (CAA) to another. Crop adaptation areas (see map) are based on soil type, elevation, temperature, and rainfall. Varieties are recommended on the basis of growing season, annual rainfall, disease incidence, and farming practices common to a given CAA.

Varieties are listed as "Recommended" or "Acceptable/Promising." Varieties with a high level of agronomic performance are listed as "Recommended." Entries must meet the minimum criteria listed in Table B before they are eligible for the "Recommended" list. Varieties listed as "Acceptable/Promising" have performed well but do not meet the criteria for the "Recommended" list. A variety needs two years and six location-years in the SDSU crop performance test trials and/or regional nurseries before it is eligible for the "Acceptable/Promising" list.

Certified seed is the best source of seed and the only way to assure genetic and variety purity.

How to Use This Information

It is suggested that growers use this publication as follows:

1. Check the variety CAA designations for the "Recommended" and "Acceptable/ Promising" lists on the inside cover and compare them to the CAA map of South Dakota. **Identify the varieties suggested for your CAA.**

2. **Evaluate the varieties you selected for desirable traits.** Variety descriptive information (tables 1e, 2e, 3e, 4e, and 5b) is updated as changes occur and is obtained from crop testing/research plots maintained by plant breeders and plant researchers. Protein, height, and bushel weight (test weight) data are obtained from every location when possible. Disease resistance ratings continually change; so new information is reported as it becomes available. Evaluate maturity by comparing the relative heading rating of each variety. The *Fusarium* head blight tolerance ratings for hard red spring wheat are also given. The head blight ratings show **there is no variety resistance to this disease.** The ratings do, however, indicate that **some varieties are more tolerant of the disease than other varieties.**

3. **Evaluate each variety you select for agronomic performance.** One- and three-year average yields for each variety tested are included for each test location if the variety was tested for three or more years, except for field pea trials where only two years of data are available. Yield and least-significant-difference (LSD) values are rounded to the nearest bushel per acre. Yield averages for spring wheat are reported in tables 1a-b, oat in tables 2a-b, barley in tables 3a-b, winter wheat in tables 4a-b, and field pea in table 5a. Averages for bushel weight, grain protein levels, lodging scores, and plant height in spring wheat are reported in tables 1c-d, oat in tables 2c-d, barley in tables 3c-d, and winter wheat in tables 4c-d.

The high and low yield variety averages, the test yield average, the least significant difference (LSD) value or the yield value needed to identify the top-performance group (TPG-value), and the test coefficient of variation (CV) values are listed below each

location yield column. Similarly, the averages for bushel weight, height, lodging, and grain protein, the LSD values needed to identify the TPG, and the test CV values for each variable are listed below each variable column. Performance information is derived from data that include both released varieties and experimental lines. Thus you can compare current varieties to experimental lines that may be released in the near future.

Comparing yields over years

Always compare one-year yields with other one-year yields and three-year yields with other three-year yields.

Determine if data is valid

Always determine if the data is valid. The coefficient of variation (CV) value listed at the bottom of each yield column is a measure of experimental error. Yield tests with CV values of 15% or higher contain a higher level of experimental error than tests with a CV of 10% or less. Test sites with a CV greater than 15% are not included in the calculations for yield stability discussed later. Likewise, the LSD value and the top performance group for yield or other performance variables are not shown if the CV exceeds 15%.

Use LSD values to evaluate yield differences between varieties

The LSD value indicates if the yield or other performance variable of one variety is significantly different from another variety. If the difference between two varieties is greater than the LSD value, the varieties differ. If the difference is equal to or less than the LSD value, the varieties do not significantly differ. For example, at Brookings, the variety Faller averaged 75 bu/a in 2009 compared to Albany at 71 bu/a. Did the yield difference between these varieties differ significantly? Compare the yield difference of 4 bu/a between the varieties (75 – 71) to the LSD value of 6 bu/a. Since the 4 bu/a difference is less than the LSD value of 6 bu/a, the varieties do not differ significantly in yield. If the difference between Faller and Albany had been 7 bu/a, the difference would have exceeded 6 bu/a; and there would have been a significant yield difference between these varieties.

Use the LSD value to determine the top performance group (TPG) or entries for each location

At each location the test entry or entries that qualify for the TPG can be identified using one- or three-year averages. The test LSD value is subtracted from the entry with highest average for yield or other variable (TPG-value). Entries with averages greater than the TPG value (highest yield minus test LSD) are in the top yield group for yield or other variables. For example, in spring wheat the top yielding entry at Spink County for 2009 was Albany that averaged 83 bu/a (table 1a). Subtracting LSD value of 7 bu/a from the highest yield entry of 83 bu/a equals 76 bu/a. Normally, entries in that column yielding 77 bu/a or higher are in the TPG. However, we can also say a yield of 76 bu/a also qualifies as a TPG-value because the yield averages are rounded to the nearest bushel. This inclusion of 76 bu/a in the TPG also makes the results indicated in the table (rounded values) agree with the results of the statistical analysis, which determines variety differences to the nearest tenth of bushel. In this case, the variety Faller would also be included in the TPG for yield at Spink County in 2009.

Similarly, the TPG of entries for the bushel weight, plant height, lodging score, and grain protein can also be identified for each table column. Note that the TPG-values for the yield, bushel weight, tall height, and high grain protein are minimum TPG-values, because the LSD value is subtracted from the highest average value to identify the TPG. In addition, the TPG for the variables height and grain protein may be identified by calculating either a maximum or minimum TPG-value. For example, you might subtract the LSD-value from the tallest entry to identify the tallest entries or TPG suitable for use as forage. In contrast, you might add the LSD-value to the shortest entry to identify the shortest entries (TPG) if you are looking for short varieties. Another example would be to subtract the protein LSD-value in barley from the highest protein entry to identify the highest protein entries for feed. In contrast, you might add the barley protein LSD-value to the lowest protein entry to identify the lowest protein entries for malting, where relatively low protein values are desired. The TPG values for all variables are reported as "TPG-value" at the bottom of each variable table with all column values that qualify for the TPG identified by the **bold type** values within a column.

Sometimes, a LSD value is not given and the designation NS^ is listed. This indicates variety differences were not significant (NS) or could not be detected. Therefore, all the varieties have a similar potential and are considered to be in the TPG. In test trials with high levels of experimental error (CV exceeds 15%), LSD and TPG values are not reported because the data contained too much experimental error to be valid.

Use top-yield group for yield information to evaluate variety yield stability

When evaluating yield performance, remember that environmental conditions change over locations and over years. Therefore, look at performance data from as many test locations and years as possible. Look at the "yield stability" of a variety over many locations. A simple way of evaluating "yield stability" is to see how often a variety is in the TPG for yield over all test locations. The top-yield frequency (expressed as percent) is the number of locations across the state where an entry was in the TPG for yield. The statewide top yield percentage for spring wheat entries are reported in table 1b, for oat entries in tables 2b, and for barley entries in table 3b. The top-yield frequencies for winter wheat were not determined because winter survival can cause large variations in top-yield frequency percentages.

A variety with a relatively high top-yield frequency will appear in the top yield group at many locations. For example, a variety with a top yield percentage of 50% or more exhibits better yield stability than a percentage of 20% or less. A percentage of 50% or higher is considered good for one year, and percentages of 80-100% are common for the longer 3-yr period. High percentages for the 3-yr period are generally more common than for the current year because there is two more years of data, which tends to reduce yield variability and enables the test to more easily identify the TPG at each location. Varieties with a high top-yield percentage have the ability to adapt to a wide range of environmental conditions over many locations. In contrast, entries with

a low top-yield frequency typically adapt to a narrow range of environments. Look for entries with top-yield percentages of 50% or higher if possible, but don't be surprised if the percentages near 100% for the longer three-year period.

Use of origin, traits, and disease reactions tables

Growers are encouraged to use the traits and disease reactions tables for spring wheat (table 1e), oat (table 2e), barley (table 3e), winter wheat (table 4e), and field pea (table 5b) every year. These tables contain the most up-to-date information in South Dakota for any changes in traits and disease races.

When evaluating winter wheat entries, it is suggested that you also review the relative coleoptile length values reported in table 12. Entries with relatively long coleoptiles are able to germinate and emerge from deeper seeding depths than entries with shorter coleoptiles. This trait may be advantageous in years where the soil moisture is deeper than the normal seeding zone. The coleoptile length of 3.2" for Harding is used as the reference standard (100%) for making comparisons. The coleoptiles of Alice, Wendy, Arapahoe, Darrell, Expedition, Millennium, and Wesley are shorter than for Harding. Note: the coleoptile for Wendy is relatively short and may exhibit poor emergence if planted deep.

Origin of Varieties Tested

Public varieties were released from state Agricultural Experiment Stations. Abbreviations for each include:

Colorado – CO	Illinois – IL
Kansas – KS	Minnesota – MN
Montana – MT	Nebraska – NE
North Dakota – ND	South Dakota – SD
Wisconsin – WI	

Many public varieties were developed and released jointly by one or more experiment stations or the USDA. Proprietary entries tested by seed company and listed by crop include:

Wheat:	Agri Pro Coker – AC	Trigen Seed, LLC – TS
	Westbred, LLC – WB	
Field pea:	Alternate Seed Strategies – ASS	
	Legume Logic – LL	Meridian Seeds – MS
	Pulse USA – PUSA	

Trial Methods

A random complete block design is used in all trials. Plots are harvested with a small plot combine. Plot size differs between the East River and West River locations. East River plots are 5-feet wide and either 12- or 14-feet long compared to West River plots measuring 5-feet wide and 25-feet long. Plots consist of drill strips with 7- or 8-inch spacing at East River locations and 10-inch spacing at West River locations. Trial locations are listed in Table A. Yield means are generated from four variety replications per location per year when possible.

Fertility and weed control programs differed between the East River (Brookings, South Shore, Beresford, Spink Co., Selby, and Warner) and West River (Bison, Ralph, and Wall) locations. East River plots were fertilized with nitrogen for a yield goal of 60 to 70 bushels per acre, depending on the cooperator. In addition, at these locations a post-emergence tank-mix of Bronate plus Puma at labeled rates was applied on the spring wheat for weed control. Also, at the Selby and Spink County spring wheat plots, Folicur was applied by cooperators according to label directions at recommended rates to protect against Fusarium head blight. West River plots were fertilized with 6 gals/acre of 10-34-0 (6.6 pounds of nitrogen and 24 pounds of phosphorous/acre) at seeding. Post-emergence applications of Starane NXT herbicide at 1.25 pt/a were applied in West River spring wheat, barley, and oats plots, except at Ralph and Bison where an additional 1 pt/a of Axial was applied on the barley and wheat. Field pea plots were seeded at 7 pure-live-seeds/ft2 (320,000 seeds/a) with inoculated seed. Chemical weed control consisted of 2 pt/a of Prowl H2O pre-emergence and 1 pt/a Poast post-emergence at Wall and Bison; and 4.5 oz/a Spartan pre-emergence at South Shore and Selby.

Seed size can vary greatly among varieties, so a seed count is conducted on each entry and all seeding rates are adjusted accordingly. The spring-seeded small grain trials were seeded at 42 pure live seeds (PLS) per square foot. The fall-seeded winter wheat trial seeding rates were 22 PLS per square foot. Under good seedbed preparation and favorable conditions these seeding rates result in seedling densities of about 38 and 20 seedlings per square foot, or densities of about 1.65 million and 870,000 seeds/a, in the spring-seeded and fall-seed small grain trials, respectively. Increase the spring seeding rates to 46 PLS per square foot if the seedbed is poor and to 50 PLS per square foot if seeding is delayed to May 1 or later. In winter wheat, increase the seeding rate to 28 PLS per square foot if the seedbed is poor. Seeding dates are listed in Table B.

Variety Release/Recommendation Committee - includes plant breeders, pathologists, research scientists, extension agronomists, and managers of the Seed Certification Service and Foundation Seed Stocks Division.

The efforts following people are gratefully acknowledged:
SDSU Oat Breeding Project – *L. Hall*
SDSU Spring Wheat Breeding Project – *K. Glover and J. Kleinjan*
SDSU Winter Wheat Breeding Project – *W. Berzonsky and S. Kalsbeck*
Brookings Agronomy Farm – *D. Doyle and Staff*
N.E. Research Farm (South Shore) – *A. Heuer*
S.E. Research Farm (Beresford) – *R. Berg and Staff*
Dakota Lakes Research Farm (Pierre) – *D. Beck and Staff*

The cooperation and resources of these cooperators are gratefully acknowledged:

Cooperator	Location	Cooperator	Location
A. & I. Ryckman	Brown Co.	R. Van Der Pol	Platte
R. Seidel	Bison	L. Erickson	Ralph
R. & L. Haskins	Hayes	Tom Fiedler	Selby
M. Aamot	Kennebec	M. Stiegelmeier	Selby
L. Novotny	Martin	S. Masat	Spink Co.
Nelson Brothers	Miller	D. Wilson	Sturgis
B. Greenough	Oelrichs	B. Jorgensen	Tripp Co.
H. Roghair	Okaton	D. Patterson	Wall
T. Young	Onida		

This report is available on the World-Wide-Web at http://www.sdstate.edu/~wpls/http/var/vartrial.html

Table A. Date test trials were seeded by crop and test location in 2009.

Location	Crop				
	HRS Wheat	Oats	Barley	Field Pea	HRW Wheat (Fall 2008)
Beresford	.	April 14	.	.	
Bison	May 14**	May 14	May 14	May 14**	Sept. 23**
Brookings	April 17	April 17	April 17	.	Sept. 6
Brown Co.	April 23	April 23	April 23	.	.
Pierre-DL	.	.	.	.	Sept. 12
Hayes	.	.	.	.	Sept. 17
Kennebec	.	.	.	.	Sept. 17
Martin	.	.	.	.	Sept. 29**
Miller	April 24	April 24	April 24	.	.
Okaton	.	April 23		.	.
Onida	.	.	.	.	Sept. 12
Platte	.	.	.	.	Sept. 14
Ralph	May 12	.	May 12	.	.
Selby	May 4	May 4	May 4	April 28	Sept. 11
South Shore	April 21	April 21	April 21	April 21	Sept. 11**
Spink Co.	April 28	.	.	.	.
Sturgis	.	.	.	.	Sept. 25
Winner	.	.	.	.	Sept. 14
Wall	April 23	April 23	April 23	April 24	Sept. 24

* IMS indicates this trial was an intensive management study.
** Location(s) dropped – high CV value indicated too much experimental error to be valid.

Table B. Minimum criteria required by crop for the recommended list in this publication.

Trait	Crop				
	Spring Wheat	Oats	Barley	Winter Wheat	Field pea
Yield, protein, bushel weight, and plant height	3/15* 3/15 3/15	3/15 3/15 3/15	3/12 3/12 3/12	3/15 3/15 3/15	3/15 3/15 3/15
Lodging & unique traits Disease reactions	WA A	WA A	WA A	WA WA	WA A
Quality data#	2/4	WA	WA	3/15	WA

* 3 years/15 location-years. # Milling and baking. $ Production & marketing.
A= annually, WA= when available.

Performance Trial Highlights

General – The performance of all the small grain crops in year 2009 was variable depending on region. Adequate moisture and cool late spring temperatures produced a bumper small grain crop at some locations in the state (Brown Co. and South Shore). Test trial locations and seeding dates are indicated in Table A.

Comments regarding tables – Tables 1a-b, 2a-b, 3a-b, 4a-b, and 5a are first sorted high to low by state 3-year and then by state 2009 yield averages. Likewise, tables 1c, 2c, 3c, and 4c are sorted high to low by state or all location grain protein (Prt) averages, while tables 1d, 2d, 3d, and 4d are sorted low to high by state or all location lodging (Ldg) score averages. Take care when reading the yield average tables because the entries are first sorted by 3-year averages then by the 2009 averages. First, evaluate yield performance by looking at the 3-year averages and then at the 2009 yield averages. In some cases, some varieties first tested in 2009 produced the highest yields for 2009. In other cases, however, the highest 2009 yields may have been produced by varieties that have been tested for three years. Look at all the values in the 2009 yield column.

HRS Wheat:

Yields (Tables 1a-b) – The entries **Traverse, Faller, and Howard at 100%; SD 3948 and Briggs at 83%; Steele-ND at 67%; and Brick at 50%** (tables 1.) were to top-yield frequency entries for the past 3-years (2007-09). These entries exhibited good yield stability or the ability to adapt to a wide range of growing conditions by being in the top-performance group at more than 50% of the locations tested for the past three years. The entries **Faller at 89%, Traverse at 78%, Albany at 67%, and SD 4023 at 56%** were the top-yield frequency entries for 2009.

Grain protein content (Table 1c) – The entries **Vantage at 15.8%; Chris at 15.3%; SD 4011, Kelby, and Alsen at 15.1%; and Glenn and SD4076 at 15.0% averaged 15% or higher in grain protein across all six locations.** Depending on location, entries had to differ by **0.3 to 0.9%** in grain protein to be significantly different from one another.

Bushel weight (Table 1c) - The top bushel weight entries (six-location averages in tables 1c) included the entries B**rick at 59.1 lb, Glenn and SD 3948 at 59.0 lb, Barlow at 58.7 and Breaker at 58.6 lb.** Depending on location, varieties had to differ from 1 to 1.5 lb to be significantly different from one another

Lodging (Table1d) – The entries **Kelby, Kuntz, SD 4024, SD 4036, Samson, Brogan, Reeder, Breaker Vantage, and Mott** averaged the best in lodging score (1) across all locations compared to the other entries. Entries generally had to in lodging score by 1 to be significantly different from one another.

Height (Table 1d) - The entries **Chris at 38" and SD 3997 at 36" was the tallest** entries, while **Kelby and Brennan at 29" were the shortest** entries across all six locations. Depending on location, entries generally had to differ by 2-3" to be significantly different in plant height.

Spring oat:

Yields (Tables 2a-b) – The entries **Souris, Hi Fi, and Beach at 100%, Stallion at 80%, and Colt and Morton at 60%** (tables 2b) were to top-yield frequency entries for the past 3-years (2007-09). The entries **SD 031128-245 at 78%, Souris and Hi Fi at 67%, and Rockford and SD 031128-330 at 56%** were to top-yield frequency entries for 2009.

Grain protein content (Table 2c) – The entry **SD 051502**, a hulless experimental line, **at 16.9%** and **Hytest at 16.5%** were the entries with the highest grain protein averages across the six locations in table 2c. Depending on location, entries had to differ by **0.7% to 1.9%** in grain protein to be significantly different from one another.

Bushel weight (Table 2c) - The top bushel weight entries across the six location listed in table 2c were the hulless entries **Buff at 43.9, SD 051502 Hls at 43.7, and Streaker Hls at 43.4 lbs.** Among the hulled entries, **Hytest at 39.2 lbs** was the highest in bushel weight. The eastern and western bushel weight averages indicate entries had to differ by **1 lb.** to be significantly different. Depending on location, entries had to differ by 1.1 to 1.9 lbs to be significantly different from one another.

Lodging (Table 2d) – All the locations listed in table 2d had a lodging score average of 2 or higher. When averaged across all six locations, the entries **SD 031128-245, Rockford, SD 031128-330, Souris, Buff, HiFi, Morton, and Beach** had better lodging scores compared to the other entries.

Height (Table 2d) - The entries **Beach at 45" and Morton at 44"** were the tallest when averaged across the six locations in table 2d, whereas Don at 33" and Don and Colt at 35" were the shortest entries. Depending on location, entries had to differ **by 3-4"** in plant height to be significantly different from one another.

Spring Barley:

Yields (Tables 3a-b) – The entries **Pinnacle at 100%, Eslick, Rawson, Rasmusson, and Conlon at 75%, and Lacey at 50%** (table 3b) were to top-yield frequency entries for the past 3-years (2007-09). The entries **Eslick at 88% and Pinnacle and Rawson at 50%** were to top-yield frequency entries for 2009.

Grain protein content (Table 3c) – The top grain protein entries were **Conlon at 12.9%** and **Robust at 12.8%**. The entries **Pinnacle at 11.1% and Rawson at 12.0%** were the lowest in grain protein when average across all six locations. In addition, Pinnacle and Rawson were generally the lowest in grain protein at every location.

Bushel weight (Table 3c) – The five-location average indicated the top bushel weight entries were **Conlon at 48.0 and Eslick at 47.5 lbs.** The varieties Drummond and Stellar-ND tended to be the lowest in bushel weight at most locations.

Lodging (Table 3d) – the entries **Pinnacle, Stellar-ND, Rawson, and Lacey** had the lowest five-location lodging score averages.

Height (Table 3d) – The five-location average indicated **Drummond and Robust at 35"** were the tallest entries, while **Eslick at 28"** was the shortest entry. Depending on location, entries had to differ by **2-3"** in plant height to be significantly different from one another.

HW Wheat:

Yield (Tables 4a-b) - The entries **Expedition, Overland, Wahoo, Darrell, Wesley, NuDakota, Millennium, Wendy, Hawken, Lyman, Harding, and Arapahoe** were in the top-yield group at half or more of the locations tested for the past three years. In 2009, the entries **SD06069, SD051118, SD06158, Expedition, Smoky Hill, Overland, Wahoo, Wesley, Wendy, and Radiant** appeared in the top-yield group at half or more of the locations tested.

Grain protein content (Table 4c) – the entries **Art at 14.8%, Wesley at 14.6%, Harding, Lyman, and SD03164-2 at 14.4%** had the most consistently high protein values across the six locations reported in table 4c. Depending on location, entries had to differ by **0.4% to 1.2%** in protein to be significantly different from one another.

Bushel weight (Table 4d) - The top bushel weight entries were **AP503CL2 at 60.2; Wendy, SD06069, Infinity CL, and Expedition at 60.0; and Smoky Hill at 59.9 lbs.** Depending on location, entries had to differ by **1.0 to 2.1 lbs** in bushel weight to be significantly different from one another.

Field Pea:

Yield (Table 5a) – When averaged over the past two years (2008-2009), the top yield group at both South Shore and Selby included the same entries **Spider, Cooper Arcadia, CDC Meadow, CDC Golden, and CDC Striker**. The top entries by location for yield in 2009 were: South Shore – **Cooper, Arcadia, CDC Meadow, CDC Golden, Thunderbird, and Commander**; Wall – **all entries were in the top yield group because no significant differences in yield could be detected**; and at Selby – **Spider, Cooper, Arcadia, CDC Meadow, CDC Golden, CDC Striker, Thunderbird, Commander, and Summit.**

Grain protein content (Table 5b, average of South Shore and Selby) – The entries **Korando at 25.8%, CDC Striker at 25,2%, and CDC Golden at 25.0%** were the highest, while **Sage at 23.3%** was the lowest in protein.

Table C. Explanation of performance table footnotes

No.	Explanation of footnotes
	Tables with yield, bushel weight, height, and grain protein averages:
[1]	Heading (small grains) – The number of days an entry takes to grow from the emergence stage to the heading stage (complete head emergence). This value is determined by comparing the entry with a known maturity check variety listed in footnote 1 at the bottom of each performance table. The heading value, if known, is listed after each variety name. In oat, Hls indicates the variety is a hulless type variety.
[2]	~W (winter wheat) – Denotes a white wheat variety.
[3]	State top-yield frequency (spring grains) – the frequency (%) of all test sites that an entry was in the top performance-group for yield on a statewide basis. A value of 50% or higher is considered good.
[4]	Lodging score (all crops): 0= all plants erect, 3= 50% of plants lodged at 45°-angle, 5= all plants flat.
[5]	Least Significant Difference (LSD 0.05) (all crops) – the difference two values within a column must equal or exceed to be significantly different from one another at the 0.05 level of probability. If the difference is less than the LSD value the difference between the values is nonsignificant (NS).
[6]	TPG-value (all crops) – the minimum value within a column that yield, bushel weight, tall height, and high protein must equal or exceed; or the maximum value within a column that short height, lodging scores, and low protein must be equal to or less than to qualify for the TPG. TPG- values are indicated in bold type.
[7]	Coefficient of variation (C.V.) - the percent of experimental error associated with a test trial. Ideally, the for yield is less than 15%. Values less than 5% tend to be less common while values of 6 to 15% are more common. Occasionally, values exceed 15%; this means the trial contained too much experimental error to be a valid test; thus, there is no data reported for that trial.
	Tables with crop variety origin, traits, and disease reaction information:
[8]	Lodging Resistance & Winter Hardy Ratings: P- poor, F- fair, G- good, VG- very good, or E- excellent.
[9]	Awn Texture (barley): S- smooth, SS- semi-smooth, SR- semi-rough, and R- rough.
[10]	End-use Quality (winter wheat): A- acceptable, F- fair, G- good, E- excellent for B- baking or N- noodles.
[11]	Coleoptile Length (winter wheat) - value is expressed as a percentage of the variety Harding (3-1/4" long).
[12]	Fusarium head blight or headscab - a disease reaction followed by a plus (+) sign indicates a variety exhibits a consistent tolerance to head blight in regards to grain yield and quality compared to other varieties.
[13]	Disease reactions: VS- very susceptible, S- susceptible, MS- moderately susceptible, MR-moderately resistant, R-resistant, VR-very resistant, M-mixture of both susceptible and resistant types.
[14]	Plant variety protection (PVP, title V certification option in the US and Plant breeders rights (PBR, Canada) are sold by variety name only as a class of certified seed. Status is yes, no or pending.
[15]	Relative maturity (field pea): E- early, M- medium, or L- late maturity.
[16]	Leaf type (field pea): N- normal or SL- semi-leafless.

Table 1a. Spring wheat yield results- South Dakota eastern locations, 2007-2009.
Table sorted by 3-yr then by 2009 state yield average.

Variety, Heading [1]	Location Yield Avg.--Bu/a at 13% moist.												East Yield Avg. bu/a		State Yield Avg. bu/a	
	Brookings		South Shore		Miller		Spink Co.		Selby		Brown Co.					
	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr
Faller, 6	**75**	**55**	**82**	**75**	43	.	**76**	**68**	**60**	**52**	**81**	**71**	70	64	61	58
Traverse, 2	66	**52**	**84**	**72**	**49**	.	66	**66**	**57**	**50**	**82**	**70**	67	62	60	57
Howard, 6	64	**50**	78	**76**	42	.	62	**63**	**58**	**47**	72	**69**	63	61	55	56
RB07, 4	58	47	63	**70**	42	.	67	**61**	**60**	**53**	73	**70**	61	60	55	56
Steele-ND, 5	59	**49**	77	**74**	43	.	59	**60**	55	**49**	72	**68**	61	60	54	55
SD 3948, -	60	**49**	70	**73**	**44**	.	69	**63**	51	43	72	**67**	61	59	56	54
Briggs-Ck, 2	58	**49**	73	**71**	41	.	67	**60**	54	45	69	**65**	60	58	54	53
Granger, 2	62	**50**	69	68	**46**	.	53	55	50	45	73	64	59	56	54	52
Brick, 0	56	48	72	**69**	**44**	.	66	**59**	51	42	64	61	59	56	53	52
Tom, 4	56	46	72	67	42	.	68	**59**	55	44	71	**68**	61	57	53	52
Glenn, 5	60	43	70	67	42	.	65	58	49	42	71	60	60	54	52	50
Kuntz, 4	53	42	66	64	38	.	66	57	**56**	42	74	**68**	59	55	50	50
Kelby, 3	52	44	63	65	40	.	66	56	49	40	63	61	56	53	48	49
Reeder, 5	52	42	67	61	40	.	73	53	51	41	72	64	59	52	51	48
Alsen, 6	57	43	62	61	36	.	63	55	47	39	68	61	56	52	49	48
Chris, 5	50	37	53	46	27	.	45	39	45	33	56	50	46	41	41	38
Albany, 6	**71**	.	77	.	40	.	**83**	.	**61**	.	**83**	.	69	.	60	.
SD 4023, -	63	.	**81**	.	42	.	**79**	.	**59**	.	**80**	.	67	.	59	.
Barlow, 3	65	.	78	.	**45**	.	67	.	53	.	74	.	64	.	56	.
SD 4024, -	60	.	69	.	43	.	**76**	.	55	.	77	.	63	.	56	.
SD 4035, -	60	.	77	.	**44**	.	73	.	52	.	76	.	64	.	55	.
SD 4073, -	58	.	73	.	37	.	72	.	55	.	78	.	62	.	55	.
Breaker, 5	60	.	75	.	41	.	68	.	53	.	74	.	62	.	55	.
Sabin, 3	61	.	71	.	**45**	.	63	.	**61**	.	71	.	62	.	55	.
Brogan, 5	56	.	64	.	41	.	74	.	53	.	76	.	61	.	53	.
Samson, 4	58	.	78	.	38	.	73	.	55	.	70	.	62	.	53	.
SD 4011, -	60	.	68	.	43	.	65	.	50	.	70	.	59	.	53	.
SD 4036, -	60	.	74	.	**44**	.	73	.	54	.	72	.	63	.	53	.
SD 4046, -	54	.	71	.	40	.	63	.	53	.	72	.	59	.	53	.
SD 3997, -	62	.	71	.	38	.	67	.	45	.	74	.	60	.	51	.
SD 4076, -	58	.	71	.	42	.	66	.	45	.	71	.	59	.	51	.
Brennan, 4	56	.	70	.	40	.	65	.	54	.	66	.	59	.	51	.
Mott, 6	50	.	70	.	27	.	64	.	51	.	68	.	55	.	49	.
Vantage, 9	54	.	61	.	28	.	58	.	**56**	.	65	.	54	.	47	.
Test avg. :	59	47	72	67	41	.	67	58	53	44	72	65	61	56	54	52
High avg. :	75	55	86	76	49	.	83	68	61	53	83	71	70	64	61	58
Low avg. :	50	37	53	46	27	.	45	39	45	33	56	50	46	41	41	38
[5] LSD (0.05):	6	6	7	7	5		7	9	5	6	4	6				
[6] TPG-value :	69	49	79	69	44		76	59	56	47	79	65				
[7] C.V. :	7	8	7	7	8		7	7	7	9	4	6				

[1] Heading- days earlier or later (- or +) than Briggs, the check variety (Ck) for maturity.
Column values in **bold type** at each location are top-performance group values.
Note that additional table footnotes are explained in Table C.

Table 1b. HRS wheat yield results- South Dakota western locations, 2007-2009.
Table sorted by 3-yr then by 2009 state yield average.

Variety, Heading [1]	Location Yield Avg.--Bu/a at 13% moist.						West Yield Avg. bu/a		State Yield Avg. bu/a		State Top-Yield Freq. (%) [3]	
	Wall		Bison		Ralph							
	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr
Faller, 6	**47**	.	**28**	**28**	**58**	.	44	.	61	58	89	100
Traverse, 2	**49**	.	**32**	**31**	**52**	.	44	.	60	57	78	100
Howard, 6	43	.	27	**29**	48	.	39	.	55	56	11	100
RB07, 4	**48**	.	27	**32**	**55**	.	43	.	55	56	33	67
Steele-ND, 5	42	.	**30**	**29**	47	.	40	.	54	55	11	100
SD 3948, -	**49**	.	**34**	**31**	**52**	.	45	.	56	54	44	83
Briggs-Ck, 2	43	.	27	**30**	51	.	40	.	54	53	11	83
Granger, 2	**49**	.	**31**	**30**	**52**	.	44	.	54	52	33	33
Brick, 0	**45**	.	**30**	**32**	46	.	40	.	53	52	33	50
Tom, 4	42	.	22	26	45	.	36	.	53	52	0	33
Glenn, 5	39	.	**30**	**28**	45	.	38	.	52	50	11	17
Kuntz, 4	43	.	21	26	35	.	33	.	50	50	11	17
Kelby, 3	39	.	21	**29**	37	.	32	.	48	49	0	17
Reeder, 5	37	.	21	**27**	50	.	36	.	51	48	0	17
Alsen, 6	40	.	22	**28**	46	.	36	.	49	48	0	17
Chris, 5	32	.	20	22	43	.	32	.	41	38	0	0
Albany, 6	39	.	**30**	.	**54**	.	41	.	60	.	67	
SD 4023, -	43	.	27	.	**56**	.	42	.	59	.	56	
Barlow, 3	42	.	**31**	.	50	.	41	.	56	.	11	
SD 4024, -	43	.	**29**	.	**53**	.	42	.	56	.	33	
SD 4035, -	43	.	**32**	.	34	.	36	.	55	.	22	
SD 4073, -	**47**	.	22	.	49	.	39	.	55	.	11	
Breaker, 5	42	.	**30**	.	**53**	.	42	.	55	.	22	
Sabin, 3	**47**	.	22	.	**57**	.	42	.	55	.	44	
Brogan, 5	44	.	22	.	44	.	37	.	53	.	0	
Samson, 4	44	.	**29**	.	36	.	36	.	53	.	11	
SD 4011, -	**45**	.	26	.	46	.	39	.	53	.	11	
SD 4036*, -	41	.	25	.	32	.	33	.	53	.	11	
SD 4046, -	**48**	.	**28**	.	44	.	40	.	53	.	22	
SD 3997, -	41	.	23	.	38	.	34	.	51	.	0	
SD 4076, -	43	.	19	.	44	.	35	.	51	.	0	
Brennan, 4	44	.	24	.	42	.	37	.	51	.	0	
Mott, 6	36	.	21	.	54	.	37	.	49	.	11	
Vantage, 9	36	.	23	.	42	.	34	.	47	.	11	
Test avg. :	43		26	29	47							
High avg. :	49		34	32	58							
Low avg. :	32	.	19	22	32	.	39	.	54	52		
[5] LSD (0.05):	4	.	6	5	6	.	45	.	61	58		
[6] TPG-value :	45	.	28	27	52	.	32	.	41	38		
[7] C.V. :	7		14	12	9							

[1] Heading- days earlier or later (- or +) than Briggs, the check variety (Ck) for maturity.
Column values in **bold type** at each location are top-performance group values.
Note that additional table footnotes are explained in Table C.

Table 1c. HRS wheat grain protein (Prt) and bushel weight (BW) averages at six South Dakota locations. Table sorted high to low by all location grain protein average.

Variety, Heading [1]	Location Protein (Prt) & Bushel weight (BW) averages												All Locations Average	
	Brookings		South Shore		Miller		Spink Co.		Selby		Brown Co.			
	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb
Vantage, 9	**14.9**	56.4	**15.9**	**58.7**	**16.6**	53.4	**16.2**	**59.8**	**15.7**	57.5	**15.9**	58.7	15.8	57.4
Chris, 5	**14.6**	54.9	15.1	56.7	15.9	51.6	15.4	58.3	**15.5**	58.1	15.4	56.3	15.3	56.0
SD 4011, -	**14.6**	55.8	14.6	56.8	15.5	54.2	15.4	58.7	**15.5**	57.7	15.3	57.9	15.1	56.9
Kelby, 3	**14.7**	55.9	**15.4**	56.5	15.3	54.9	15.0	58.6	**15.3**	59.2	15.1	58.2	15.1	57.2
Alsen, 6	**14.5**	56.1	**15.5**	57.1	15.8	55.4	15.4	58.9	14.7	58.5	14.9	59.2	15.1	57.5
Glenn, 5	14.1	**57.5**	15.2	**60.1**	15.3	**56.3**	14.8	**60.3**	**15.7**	**60.5**	15.3	59.6	15.0	59.0
SD 4076, -	**14.5**	56.1	14.8	**58.7**	15.4	**56.7**	14.8	59.0	**15.5**	58.9	15.0	59.6	15.0	58.1
RB07, 4	14.2	54.6	15.1	56.6	15.7	52.6	15.0	58.1	**14.8**	**60.0**	15.0	58.7	14.9	56.7
Brick, 0	**14.8**	**58.1**	**15.5**	**59.5**	14.8	57.7	14.8	**59.5**	14.7	**60.2**	15.1	59.7	14.9	59.1
Reeder, 5	**14.4**	54.2	14.7	58.3	15.3	53.0	15.0	**59.2**	**15.0**	58.0	15.1	59.4	14.9	57.0
Brennan, 4	**14.5**	55.6	14.9	57.4	15.4	53.7	14.8	58.1	**14.8**	**59.8**	14.9	58.6	14.9	57.2
Sabin, 3	**14.5**	56.3	14.6	57.8	15.7	52.5	15.1	58.8	14.0	**59.5**	15.1	59.6	14.8	57.4
SD 3997, -	14.1	56.4	15.1	**58.5**	15.2	53.4	14.5	58.9	**14.9**	57.9	15.1	59.1	14.8	57.4
Briggs-Ck, 2	14.3	**58.2**	14.5	**58.6**	15.2	54.7	14.9	59.5	14.2	59.1	15.3	58.3	14.7	58.1
Granger, 2	14.3	55.7	14.6	57.6	14.9	54.2	15.0	57.9	14.5	58.2	14.8	58.4	14.7	57.0
Barlow, 3	14.1	**57.0**	15.1	**59.9**	15.0	**56.6**	14.4	**60.1**	14.4	58.5	14.9	**60.3**	14.6	58.7
Brogan, 5	14.1	55.1	14.8	57.0	15.4	54.7	14.4	**60.2**	14.1	58.7	14.8	**60.2**	14.6	57.6
SD 3948, -	14.0	**58.0**	14.6	56.9	15.1	**57.5**	14.8	**60.2**	14.2	**60.7**	15.1	**60.6**	14.6	59.0
Steele-ND, 5	14.3	55.1	14.2	**59.0**	14.7	53.9	14.7	**60.1**	14.7	**60.0**	15.0	59.2	14.6	57.9
Breaker, 5	13.9	56.0	14.7	**59.7**	15.0	**56.5**	14.4	**60.1**	**14.9**	**59.4**	14.5	59.6	14.6	58.6
Howard, 6	13.9	**57.0**	14.5	**59.3**	14.8	53.0	14.6	**59.9**	**14.9**	**59.7**	14.7	59.5	14.5	58.1
SD 4036, -	14.0	53.7	14.3	56.1	15.3	53.7	14.2	57.5	**14.9**	56.6	14.6	59.1	14.5	56.1
Tom, 4	14.1	56.3	14.6	**59.0**	14.9	54.8	14.2	58.4	14.7	59.2	14.7	58.5	14.5	57.7
Samson, 4	14.2	54.5	14.2	57.8	15.4	53.0	14.4	59.0	14.1	57.8	14.5	58.2	14.5	56.7
Kuntz, 4	14.2	55.9	14.5	58.1	15.1	52.5	14.6	57.9	14.2	58.4	14.2	58.6	14.4	56.9
Mott, 6	13.7	53.6	14.2	56.8	14.8	50.4	14.3	58.3	14.5	58.7	15.0	58.2	14.4	56.0
SD 4035, -	14.3	54.1	14.4	**58.5**	15.0	54.9	14.1	57.9	14.0	58.5	14.7	59.4	14.4	57.2
Traverse, 2	13.9	54.0	14.2	57.7	14.7	54.0	14.8	56.7	14.2	57.0	14.6	58.8	14.4	56.4
SD 4046, -	13.8	55.5	14.1	**59.3**	15.1	54.9	14.4	**59.4**	13.6	58.4	14.4	**60.8**	14.2	58.0
SD 4023, -	14.0	56.4	14.1	**59.8**	15.1	53.8	14.2	**60.2**	14.0	**59.9**	14.1	59.6	14.2	58.3
Faller, 6	13.3	56.8	13.5	57.7	15.1	53.0	14.5	58.6	14.3	59.3	14.6	**59.8**	14.2	57.5
SD 4073, -	13.9	52.4	13.8	57.2	15.0	52.9	14.2	58.3	13.9	58.1	14.0	58.4	14.1	56.2
SD 4024, -	13.8	55.2	14.0	58.0	14.9	54.4	14.1	**59.8**	14.0	59.2	14.0	59.7	14.1	57.7
Albany, 6	12.8	56.6	13.6	57.6	14.8	54.8	13.6	**60.1**	13.0	59.2	13.9	**60.0**	13.6	58.0
Test avg. :	14.1	55.7	14.6	58.1	15.2	54.1	14.7	59.0	14.5	58.8	14.8	59.1		
High avg. :	14.9	58.2	15.9	60.1	16.6	57.7	16.2	60.3	15.7	60.7	15.9	60.8		
Low avg. :	12.8	52.4	13.5	56.1	14.4	50.4	13.6	56.7	13.0	56.6	13.9	56.3		
[5] Lsd(.05) :	0.5	1.5	0.6	1.7	0.4	1.4	0.4	1.2	0.9	1.3	0.3	1.0		
[6] TPG-value :	14.4	56.7	15.3	58.4	16.2	56.3	15.8	59.1	14.8	59.4	15.6	59.8		
[7] C.V. :	2	2	3	2	2	2	2	1	5	2	2	1		

[1] Heading- days earlier or later (- or +) than Briggs, the check variety (Ck) for maturity.
Column values in **bold type** at each location are top-performance group values.
Note that additional table footnotes are explained in Table C.

Table 1d. HRS wheat lodging (Ldg) score and plant height (Ht) averages at six South Dakota locations. Table sorted low (best) to high by all locations average lodging scores.

Variety, Heading [1]	Location Avg.- Lodging score (Ldg) & Plant height (Ht)												All Locations Average	
	Brookings		South Shore		Miller		Spink Co.		Selby		Brown Co.			
	Ldg score	Ht inch	Ldg score	Ht inch	Ldg score	Ht inch	Ldg score	Ht inch	Ldg score	Ht inch	Ldg score	Ht inch	Ldg score	Ht inch
Kelby, 3	**1**	28	2	28	2	26	.	32	**1**	27	2	31	1	29
Kuntz, 4	**1**	30	2	29	2	28	.	35	**1**	27	2	31	1	30
SD 4024, -	**1**	28	2	30	2	28	.	35	**1**	30	**1**	32	1	30
SD 4036, -	**1**	29	2	30	2	27	.	35	**1**	25	**1**	32	1	30
Samson, 4	**1**	29	**1**	30	2	27	.	36	**1**	26	**1**	30	1	30
Brogan, 5	**1**	30	**1**	32	2	29	.	37	**1**	30	2	31	1	31
Reeder, 5	**1**	30	2	31	2	31	.	37	**1**	31	**1**	33	1	32
Breaker, 5	**1**	30	2	33	2	29	.	37	**1**	30	2	33	1	32
Vantage, 9	**1**	31	**1**	33	**1**	29	.	37	**1**	32	**1**	32	1	32
Mott, 6	**1**	32	**1**	36	**1**	33	.	38	**1**	**37**	**1**	**36**	1	35
Brennan, 4	**1**	29	2	29	2	26	.	35	**1**	27	2	30	2	29
SD 4023, -	3	29	3	31	3	29	.	36	**1**	29	3	31	2	31
Albany, 6	2	32	2	30	2	28	.	36	**1**	29	3	32	2	31
SD 4076, -	3	30	2	33	3	29	.	37	**1**	29	2	31	2	31
RB07, 4	2	30	3	31	2	30	.	35	**1**	32	2	31	2	31
Sabin, 3	3	31	3	31	2	31	.	36	**1**	30	3	32	2	32
SD 4011, -	3	31	2	33	3	30	.	35	**1**	31	3	33	2	32
Alsen, 6	**1**	32	2	33	3	28	.	36	**1**	30	2	34	2	32
SD 4035, -	2	30	2	32	2	29	.	36	**1**	32	**1**	32	2	32
SD 3948, -	3	33	3	34	3	31	.	39	**1**	32	2	33	2	33
Tom, 4	3	32	3	32	2	30	.	37	**1**	32	3	34	2	33
Faller, 6	2	32	2	34	2	32	.	37	**1**	31	2	33	2	33
SD 4073, -	2	32	2	33	2	30	.	38	**1**	32	2	34	2	33
Steele-ND, 5	3	32	3	32	3	31	.	37	**1**	34	2	35	3	33
Brick, 0	3	34	3	35	3	31	.	38	2	32	2	35	2	34
Howard, 6	2	32	3	36	3	29	.	37	**1**	34	3	34	2	34
Barlow, 3	2	33	2	33	2	30	.	38	**1**	33	2	35	2	34
Glenn, 5	2	33	2	34	3	31	.	38	**1**	34	**1**	34	2	34
Granger, 2	2	34	3	36	3	33	.	39	2	35	3	35	2	35
Traverse, 2	2	34	3	34	3	32	.	39	2	34	2	**36**	2	35
SD 3997, -	**1**	**35**	2	**37**	2	33	.	37	**1**	36	2	**38**	2	36
SD 4046, -	3	33	3	35	3	31	.	38	**1**	34	4	35	3	34
Briggs-Ck, 2	3	33	3	34	3	32	.	37	2	34	3	32	3	34
Chris, 5	3	**37**	4	**39**	3	**36**	.	**43**	2	**40**	4	**37**	3	38
Test avg. :	2	31	2	33	2	30	.	37	1	32	2	33		
High avg. :	3	37	4	39	3	36	.	43	2	40	4	38		
Low avg. :	1	28	1	28	1	26	.	32	1	25	1	30		
[5] Lsd(.05) :	1	2	1	2	1	2		3	1	3	1	2		
[6] TPG-value :	1	35	1	37	1	34		40	1	37	1	36		
[7] C.V. :	25	6	22	5	22	5		6	20	6	27	5		

[1] Heading- days earlier or later (- or +) than Briggs, the check variety (Ck) for maturity.
Column values in **bold type** at each location are top-performance group values.
Note that additional table footnotes are explained in Table C.

Table 1e. Origin, traits, and disease reactions for spring wheat varieties tested in 2009. Table sorted early to late maturity by relative heading (Rel Hdg).

Variety	Origin & Year	Rel Hdg [1]	Ldg Res [8]	Disease Reactions [13]				PVP Status [14]
				Rust			Fusarium Head Blight	
				Stripe	Stem	Leaf		
Brick	SD-08	0	G	-	MR	MR	MR+	Yes
Briggs-Ck	SD-02	2	G	MR	R	MR	M+	Yes
Granger	SD-04	2	G	MR	R	MR	M+	Yes
Traverse	SD-06	2	G	MR	R	MR	MR+	Yes
Barlow	ND-09	3	G	-	R	R	MR+	Yes
Kelby	AW-06	3	VG	-	MR	R	MR	Yes
Sabin	MN-09	3	G	-	R	MR	MR+	Yes
Brennan	AW-09	4	G	-	R	MR	M++	Pdg
Samson	WB-07	4	G	S	R	MR	S	Yes
Tom	MN-08	4	G	-	MR	MR	MR+	Yes
Kuntz	AW-07	4	VG	MS	MR	MR	MR	Yes
RB07	MN-07	4	G	MS	MR	MR	MS	Yes
Breaker	WB-07	5	-	S	R	MR	MR	Yes
Brogan	WB-09	5	-	S	MR	MR	MS	Yes
Chris	MN-65	5	P	-	R	MS	S	No
Glenn	ND-05	5	G	MR	R	R	MR+	Yes
Reeder	ND-99	5	G	MR	R	MS	MS	Yes
Steele-ND	ND-04	5	G	MR	MR	R	MR+	Yes
Albany	TS-09	6	G	R	R	MS	MR+	Yes
Alsen	ND-00	6	G	R	R	MS	MR+	Yes
Howard	ND-06	6	G	-	R	R	MR+	Yes
Faller	ND-07	6	G	-	R	R	MR+	Yes
Mott	ND-09	6	G	-	MR	MS	S	Yes
Vantage	WB-07	9	-	S	R	MS	MS	Yes
SD 3948	SD-	-	-	MR	-	MR	MR	-
SD 3997	SD-	-	-	-	-	-	-	-
SD 4011	SD-	-	-	-	-	-	-	-
SD 4023	SD-	-	-	-	-	-	-	-
SD 4024	SD-	-	-	-	-	-	-	-
SD 4035	SD-	-	-	-	-	-	-	-
SD 4036	SD-	-	-	-	-	-	-	-
SD 4046	SD-	-	-	-	-	-	-	-
SD 4073	SD-	-	-	-	-	-	-	-
SD 4076	SD-	-	-	-	-	-	-	-

[1] Heading- days earlier or later (- or +) than Briggs, the check variety (Ck) for maturity.
Note that additional table footnotes are explained in Table C.

Table 2a. Spring oat yield results- South Dakota eastern locations, 2007-2009.
Table sorted by 3-yr then by 2009 state yield average.

Variety, Heading [1]	Location Yield Avg. -- Bu/a at 13% moisture												East Yield Avg. bu/a		State Yield Avg. bu/a	
	Brookings		So. Shore		Beresford		Miller		Selby		Brown Co.					
	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr
Souris, 7	167	**141**	**207**	**168**	105	**125**	**148**	.	**146**	.	**165**	**145**	156	145	126	130
HiFi, 8	**171**	**138**	192	**161**	**124**	**124**	**149**	.	**141**	.	**157**	**143**	156	142	126	126
Beach, 7	157	**139**	174	**155**	**126**	**127**	130	.	132	.	130	**130**	142	138	117	123
Stallion, 9	138	**132**	136	141	97	**122**	**138**	.	133	.	141	**135**	131	133	108	118
Morton, 8	112	114	155	**148**	119	**122**	136	.	130	.	128	123	130	127	108	115
Colt, 0	109	**117**	140	135	**124**	**129**	130	.	126	.	127	124	126	126	104	114
Don, 1	119	114	127	127	105	**117**	125	.	126	.	125	124	121	121	100	108
Reeves, 2	108	112	117	125	117	**122**	130	.	**141**	.	124	116	123	119	100	106
Jerry, 5	102	109	134	131	107	**115**	129	.	110	.	123	114	118	117	99	108
Buff Hls, 3	112	90	130	116	98	95	102	.	106	.	110	99	110	100	90	90
Streaker Hls, 3	114	97	110	113	54	78	103	.	94	.	113	105	98	98	84	89
Hytest, 4	103	96	111	107	94	85	94	.	98	.	112	101	102	97	86	89
Stark Hls, 7	113	78	137	101	92	79	105	.	115	.	132	97	116	89	96	79
SD 031128-245, -	174	.	177	.	**139**	.	**143**	.	**152**	.	**151**	.	156	.	127	.
Rockford, 8	**184**	.	195	.	94	.	**143**	.	134	.	**157**	.	151	.	125	.
SD 031128-330, -	170	.	179	.	**139**	.	136	.	**141**	.	148	.	152	.	124	.
SD 041445-93, -	138	.	146	.	**133**	.	134	.	131	.	**150**	.	139	.	111	.
SD 1445-119, -	124	.	141	.	**141**	.	142	.	130	.	144	.	137	.	112	.
SD 060966, -	98	.	133	.	**126**	.	136	.	137	.	146	.	129	.	108	.
SD 051502 Hls, -	98	.	123	.	99	.	95	.	102	.	109	.	104	.	84	.
Test avg. :	131	114	148	133	112	111	127	.	126	.	135	120	130	119	107	107
High avg. :	184	141	207	168	141	129	149	.	152	.	165	145	156	145	127	130
Low avg. :	98	78	110	101	54	78	94	.	94	.	109	97	98	89	84	79
[5] LSD (0.05):	13	24	11	25	19	21	11		12		15	19				
[6] TPG-value :	171	117	196	143	122	108	138		140		150	126				
[7] C.V. :	7	7	5	7	12	9	6		7		8	8				

[1] Heading- days earlier or later (- or +) than Don, the check variety (Ck) for maturity. Hls = Hulless variety.
Column values in bold type at each location are top-performance group values.
Note that additional table footnotes are explained in Table C.

Table 2b. Spring oat yield results- South Dakota western locations, 2007-2009.
Table sorted by 3-yr then by 2009 state yield average.

Variety, Heading [1]	Location Yield Avg Bu/a at 13% moisture						West Yield Avg. bu/a		State Yield Avg. bu/a		State Top-Yield Freq. (%)	
	Wall		Bison		Okaton							
	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr
Souris, 7	86	.	54	**69**	**55**	.	76	.	126	130	67	100
HiFi, 8	85	.	62	**66**	**53**	.	74	.	126	126	67	100
Beach, 7	**90**	.	**54**	**63**	**56**	.	79	.	117	123	44	100
Stallion, 9	**92**	.	43	**61**	**53**	.	79	.	108	118	33	80
Morton, 8	77	.	**57**	**68**	**58**	.	71	.	108	115	22	60
Colt, 0	81	.	48	**65**	48	.	70	.	104	114	11	60
Don, 1	80	.	48	**60**	49	.	70	.	100	108	0	40
Reeves, 2	79	.	38	**53**	42	.	67	.	100	106	22	40
Jerry, 5	74	.	**59**	**69**	**53**	.	67	.	99	108	11	40
Buff Hls, 3	74	.	36	51	40	.	64	.	90	90	0	20
Streaker Hls, 3	86	.	37	52	45	.	74	.	84	89	0	20
Hytest, 4	67	.	**51**	**58**	41	.	58	.	86	89	0	20
Stark Hls, 7	80	.	45	41	46	.	70	.	96	79	0	0
SD 031128-245, -	**92**	.	**60**	.	**53**	.	79	.	127	.	78	.
Rockford, 8	**97**	.	**57**	.	**61**	.	85	.	125	.	56	.
SD 031128-330, -	**92**	.	**59**	.	**53**	.	79	.	124	.	56	.
SD 041445-93, -	67	.	**51**	.	49	.	61	.	111	.	33	.
SD 1445-119, -	67	.	**62**	.	**54**	.	63	.	112	.	33	.
SD 060966, -	**92**	.	**51**	.	50	.	78	.	108	.	33	.
SD 051502 Hls, -	71	.	27	.	31	.	58	.	84	.	0	.
Test avg. :	81	.	50	60	50	.	71	.	107	107		
High avg. :	97	.	62	69	61	.	85	.	127	130		
Low avg. :	67	.	27	41	31	.	58	.	84	79		
[5] LSD (0.05):	7		12	13	8							
[6] TPG-value :	90		50	56	53							
[7] C.V. :	6		14	9	12							

[1] Heading- days earlier or later (- or +) than Don, the check variety (Ck) for maturity. Hls = hulless variety.
Column values in **bold type** at each location are top-performance group values.
Note that additional table footnotes are explained in Table C.

Table 2c. Spring oat grain protein (Prt) and bushel weight (BW) averages at six South Dakota locations. Sorted high to low by all location grain protein average.

Variety, Heading [1]	Location Protein (Prt) & Bushel weight (BW)												All Locations Average	
	Brookings		South Shore		Beresford		Miller		Selby		Brown Co.			
	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb
SD 051502 Hls, -	**13.2**	39.8	**18.4**	44.6	**18.6**	**40.8**	**17.2**	**44.4**	**17.7**	**46.5**	**16.5**	46.2	16.9	43.7
Hytest, 4	**14.0**	38.1	**17.8**	40.0	**18.2**	37.5	15.1	36.1	**17.3**	40.1	**16.6**	43.7	16.5	39.2
Streaker Hls, 3	**12.9**	42.9	**17.7**	44.1	16.8	35.9	**15.9**	**44.4**	16.1	44.7	14.6	**48.3**	15.7	43.4
Buff Hls, 3	**13.0**	**44.8**	16.4	**46.2**	16.9	**41.5**	15.3	41.4	14.7	41.1	**15.9**	**48.5**	15.4	43.9
Reeves, 2	**13.4**	37.3	15.9	37.5	15.4	34.3	13.4	36.8	15.1	37.7	15.5	38.4	14.7	37.0
Stark Hls, 7	9.8	40.4	16.4	42.7	15.4	33.8	15.6	42.1	15.1	43.4	15.3	**47.3**	14.6	41.6
Stallion, 9	**12.7**	36.2	15.5	37.5	15.6	31.4	14.2	36.7	13.8	38.6	14.6	42.1	14.4	37.1
Jerry, 5	12.3	33.7	15.0	38.4	15.4	33.9	13.4	35.8	13.9	36.3	14.5	40.8	14.1	36.5
Colt, 0	12.3	36.1	15.2	39.8	14.7	35.2	12.4	35.2	14.8	37.3	14.1	38.4	13.9	37.0
SD 031128-330, -	**12.6**	38.6	15.8	39.3	14.4	34.2	11.6	35.9	14.9	37.3	14.0	38.6	13.9	37.3
SD 031128-245, -	**14.3**	38.9	15.4	38.9	14.2	32.9	12.7	36.1	13.7	37.3	12.9	38.2	13.9	37.0
Morton, 8	**13.2**	33.3	14.4	36.0	14.7	30.0	12.3	35.7	13.9	37.3	14.1	39.4	13.7	35.3
Don, 1	12.4	34.6	13.9	36.4	14.1	32.4	13.5	35.9	14.0	34.7	14.3	37.1	13.7	35.2
SD 060966, -	12.4	34.8	14.8	39.0	13.5	34.4	13.6	36.6	13.9	38.1	13.6	38.5	13.6	36.9
SD 041445-93, -	10.8	36.2	14.9	37.7	15.5	35.6	11.9	36.1	14.5	38.7	13.8	41.1	13.6	37.5
Rockford, 8	9.7	38.9	15.2	38.1	14.8	28.3	13.6	35.5	14.1	38.5	14.0	40.7	13.5	36.7
HiFi, 8	10.8	37.6	15.3	37.7	14.8	29.5	12.9	34.6	13.8	37.1	13.6	39.5	13.5	36.0
Souris, 7	10.6	36.9	15.2	37.7	14.8	30.7	12.3	34.7	14.4	37.4	13.6	39.8	13.5	36.2
Beach, 7	10.0	37.3	14.5	38.3	14.9	33.3	13.0	36.8	14.0	38.5	13.5	40.6	13.3	37.5
SD 1445-119, -	11.1	36.2	14.2	38.0	14.6	36.0	11.9	36.3	14.1	38.5	13.8	39.9	13.3	37.5
Test avg. :	12.1	37.6	15.6	39.4	15.4	34.1	13.6	37.3	14.7	39.0	14.4	41.4	14.3	38.1
High avg. :	14.3	44.8	18.4	46.2	18.6	41.5	17.2	44.4	17.7	46.5	16.6	48.5	16.9	43.9
Low avg. :	9.7	33.3	13.9	36.0	13.5	28.3	11.6	34.6	13.7	34.7	12.9	37.1	13.3	35.2
[5] Lsd(.05) :	1.9	1.3	0.7	1.5	1.1	1.9	1.4	1.3	0.8	1.1	0.9	1.7		
[6] TPG-value :	12.5	43.6	17.7	44.8	17.5	39.7	15.9	43.2	17.0	45.5	15.8	46.9		
[7] C.V. :	11	2	3	3	5	4	8	3	4	2	5	3		

[1] Heading- days earlier or later (- or +) than Don, the check variety (Ck) for maturity. Hls = hulless variety.
Column values in **bold type** at each location are top-performance group values.
Note that additional table footnotes are explained in Table C.

Table 2d. Spring oat lodging (Ldg) score and plant height (Ht) averages at six South Dakota locations. Sorted low (best) to high by all locations average lodging scores.

Variety, Heading [1]	Location Lodging score (Ldg) & Plant height (Ht)												All Locations Average	
	Brookings		South Shore		Beresford		Miller		Selby		Brown Co.			
	Ldg score	Ht inch	Ldg score	Ht inch	Ldg score	Ht inch	Ldg score	Ht inch	Ldg score	Ht inch	Ldg score	Ht inch	Ldg score	Ht inch
SD 031128-245, -	**2**	46	**2**	41	**3**	41	**1**	35	**1**	**40**	**2**	41	2	41
Rockford, 8	**1**	**48**	**2**	44	**3**	**43**	**1**	38	**1**	37	**2**	41	2	42
SD 031128-330, -	**2**	44	**2**	41	**3**	40	**1**	37	**1**	**39**	**2**	36	2	40
Souris, 7	**2**	42	**2**	39	**3**	39	**1**	35	2	36	**2**	37	2	38
Buff Hls, 3	**2**	38	**2**	37	4	36	2	33	**1**	34	**2**	34	2	35
HiFi, 8	**2**	**47**	**2**	44	**3**	40	2	39	**1**	36	3	**42**	2	41
Morton, 8	3	**50**	**2**	**49**	4	**45**	2	39	2	**40**	**2**	**44**	2	44
Beach, 7	3	**47**	3	**48**	4	**45**	2	**43**	**1**	**40**	3	**45**	2	45
Don, 1	4	37	3	34	**3**	34	**1**	30	2	33	3	31	3	33
Stark Hls, 7	3	46	3	**47**	5	42	2	**40**	2	**40**	3	**44**	3	43
Colt, 0	5	39	3	37	4	37	**1**	31	2	35	**2**	34	3	35
Hytest, 4	3	45	3	44	5	41	2	**40**	2	**41**	3	41	3	42
Jerry, 5	4	44	4	42	4	41	2	36	**1**	**38**	3	39	3	40
SD 041445-93, -	4	44	3	40	5	40	2	36	2	**41**	3	39	3	40
Stallion, 9	4	45	4	44	5	41	2	38	2	**39**	3	41	3	41
SD 060966, -	5	36	4	36	4	35	**1**	32	3	33	**2**	31	3	34
SD 1445-119, -	4	46	4	40	5	41	2	38	2	**38**	3	39	3	40
Reeves, 2	4	43	4	39	5	40	3	36	2	**38**	4	39	4	39
Streaker Hls, 3	4	41	4	38	5	39	2	34	3	36	4	40	4	38
SD 051502 Hls, -	4	42	4	37	5	40	3	33	3	**39**	4	39	4	38
Test avg. :	3	43	3	41	4	40	2	36	2	38	3	39		
High avg. :	5	50	4	49	5	45	3	43	3	41	4	45		
Low avg. :	1	36	2	34	3	34	1	30	1	33	2	31		
[5] Lsd(.05) :	1	3	1	4	1	2	1	4	1	3	1	4		
[6] TPG-value :	1 & 2	47	2	46	3	43	1	40	1	38	2	42		
[7] C.V. :	21	5	17	6	11	3	22	8	29	5	17	6		

[1] Heading- days earlier or later (- or +) than Don, the check variety (Ck) for maturity. Hls = Hulless variety.
Column values in **bold type** at each location are top-performance group values.
Note that additional table footnotes are explained in Table C.

Table 2e. Origin, variety traits, and disease reactions for oat entries tested in 2009.

Variety	Origin	Rel Hdg [1]	Ldg Res [8]	Grain Color	Disease Reactions				PVP Status [14]
					Smut	Rust			
						Stem	Crown	Leaf	
Colt	SD-08	0	-	White	VR	MS	MS	MS	Yes
Don	IL-85	1	G	White	R	MS	S	MR	No
Reeves	SD-02	2	G	White	MR	S	MS	MS	No
Buff Hls	SD-02	3	G	Hulless	R	S	MS	MR	No
Streaker Hls	SD-09	3	-	Hulless	-	MR	MS	R	Yes
Hytest	SD-86	4	G	Lt.Cream	MR	MS	S	S	No
Jerry	ND-94	5	G	White	MS	MS	S	MS	Yes
Beach	ND-04	7	F-G	White	R	S	MS	MS	Yes
Stark Hls	ND-04	7	G	Hulless	-	MR	MS	S	Yes
Souris	ND-06	7	G	White	MR	MS	R	MS	Yes
HiFi	ND-01	8	G	White	MR	R	MR	MS	Yes
Morton	ND-01	8	G	White	R	MR	R	MS	Yes
Rockford	ND-09	8	-	-	-	S	MR	-	Yes
Stallion	SD-06	9	G	White	S	S	MR	MR	Yes
SD 041445-93	SD-	-	-	-	-	-	-	-	-
SD 1445-119	SD-	-	-	-	-	-	-	-	-
SD 051502 Hls	SD-	-	-	Hulless	-	-	-	-	-
SD 060966	SD-	-	-	-	-	-	-	-	-
SD 031128-245	SD-	-	-	-	-	-	-	-	-
SD 031128-330	SD-	-	-	-	-	-	-	-	-

[1] Heading- days earlier (-) or later than Don, the check variety (Ck) for maturity. Hls = Hulless variety.
Note that additional table footnotes are explained in Table C.

Table 3a. Spring barley yield results- South Dakota east locations, 2007-2009.
Table sorted by 3-yr then by 2009 state yield average.

Variety, Heading [1]	Location Yield Avg. (Bu/a at 13% moist.)										East Yield Avg. bu/a		State Yield Avg. bu/a	
	Brookings		South Shore		Miller		Selby		Brown Co.					
	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr
Pinnacle, 3	**89**	**74**	105	**96**	**95**	.	**80**	**70**	**107**	**94**	95	84	82	84
Eslick, 3	**87**	**72**	**124**	**99**	**95**	.	**89**	**79**	92	81	97	83	89	83
Rawson, 2	**86**	**73**	**121**	**101**	**87**	.	74	66	**102**	**87**	94	82	83	82
Rasmusson, 3	84	**74**	107	89	84	.	**79**	**72**	**108**	**85**	92	80	79	80
Lacey, 0	**85**	**73**	105	86	83	.	**81**	69	**106**	**83**	92	78	79	78
Drummond, 2	82	66	100	87	77	.	74	69	**103**	81	87	76	75	76
Conlon, 0	**93**	**73**	**118**	**96**	82	.	**80**	58	94	78	93	76	70	76
Stellar-ND, 2	**89**	68	93	81	80	.	72	66	**103**	81	87	74	75	74
Robust, 3	74	63	96	79	77	.	67	59	91	71	81	68	69	68
Test avg. :	85	71	107	90	84	.	77	68	100	82	90	78	77	78
High avg. :	93	74	124	101	95	.	89	79	108	94	97	84	89	84
Low avg. :	74	63	93	79	77	.	67	58	91	71	81	68	69	68
[5] LSD (0.05):	8	7	12	11	9		10	9	8	12				
[6] TPG-value :	85	67	112	90	86		79	70	100	82				
[7] C.V. :	7	8	8	7	8		9	9	6	8				

[1] Heading- days earlier or later (- or +) than Lacey, the check variety (Ck) for maturity.
Column values in bold type at each location are top-performance group values.
Note that additional table footnotes are explained in Table C.

Table 3b. Spring barley yield results- South Dakota west locations, 2007-2009.
Table sorted by 3-yr then by 2009 state yield average.

Variety, Heading [1]	Location Yield Avg. (Bu/a at 13% moist.)						West Yield Avg. bu/a		State Yield Avg. bu/a		State Top-Yield Freq. (%)[3]	
	Wall		Bison		Ralph							
	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr
Pinnacle, 3	78	.	33	.	70	.	60	.	82	84	50	100
Eslick, 3	**86**	.	**48**	.	**90**	.	75	.	89	83	88	75
Rawson, 2	**83**	.	39	.	73	.	65	.	83	82	50	75
Rasmusson, 3	70	.	35	.	66	.	57	.	79	80	25	75
Lacey, 0	73	.	36	.	64	.	58	.	79	78	38	50
Drummond, 2	68	.	35	.	58	.	54	.	75	76	13	0
Conlon, 0	71	.	13	.	9	.	31	.	70	76	38	75
Stellar-ND, 2	73	.	29	.	61	.	54	.	75	74	25	0
Robust, 3	69	.	30	.	51	.	50	.	69	68	0	0
Test avg. :	74	.	33	.	60	.	56	.	77	78		
High avg. :	86	.	48	.	90	.	75	.	89	84		
Low avg. :	68	.	13	.	9	.	31	.	69	68		
[5] LSD (0.05):	5		6		10							
[6] TPG-value :	81		42		80							
[7] C.V. :	5		11		12							

[1] Heading- days earlier or later (- or +) than Lacey, the check variety (Ck) for maturity.
Column values in **bold type** at each location are top-performance group values.
Note that additional table footnotes are explained in Table C.

Table 3c. Spring barley grain protein (Prt) and bushel weight (BW) averages at five South Dakota locations. Sorted high to low by all location grain protein average.

Variety, Heading [1]	Location Protein (Prt) & Bushel weight (BW)										All Locations average	
	Brookings		South Shore		Miller		Selby		Brown Co.			
	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb
Conlon, 0	**12.0**	**47.8**	**12.5**	**49.7**	**13.4**	**46.0**	**13.0**	**48.7**	**13.6**	**46.5**	12.9	48.0
Robust, 3	11.4	45.3	**12.9**	46.4	12.7	42.1	**13.2**	46.1	**13.8**	42.6	12.8	45.7
Drummond, 2	**11.8**	43.8	**12.1**	44.8	12.6	41.7	**13.2**	45.6	**13.5**	43.8	12.6	45.1
Stellar-ND, 2	**11.8**	44.5	**12.3**	44.3	**13.2**	41.8	12.5	45.0	13.1	43.3	12.5	44.9
Rasmusson, 3	11.5	45.0	12.0	46.4	12.8	43.7	12.5	46.5	**13.2**	44.4	12.4	46.1
Lacey, 0	**11.8**	45.3	**12.3**	47.0	12.6	43.7	12.4	46.1	13.0	44.9	12.4	46.5
Eslick, 3	**11.7**	**47.9**	12.0	48.3	12.6	44.4	11.4	**48.0**	**13.7**	44.6	12.3	47.5
Rawson, 2	11.4	45.3	11.4	47.8	12.2	43.5	12.3	46.2	12.8	45.2	12.0	46.5
Pinnacle, 3	10.0	45.3	10.9	45.0	11.4	43.0	11.3	45.6	11.8	44.7	11.1	45.9
Test avg. :	11.5	45.5	12.0	46.5	12.6	43.2	12.4	46.3	13.2	44.3		
High avg. :	12.0	47.9	12.9	49.7	13.4	46.0	13.2	48.7	13.8	46.5		
Low avg. :	10.0	43.8	10.9	44.3	11.4	41.7	11.3	45.0	11.8	42.6		
[5] Lsd(.05) :	0.4	1.0	0.8	1.0	0.4	1.0	0.6	-0.9	0.6	1.0		
[6] TPG-value :	11.6	46.9	12.1	48.7	13.0	45.0	12.6	47.8	13.2	45.5		
[7] C.V. :	2	1	5	2	2	2	4	1	3	2		

[1] Heading- days earlier or later (- or +) than Lacey, the check variety (Ck) for maturity.
Column values in **bold type** at each location are top-performance group values.
Note that additional table footnotes are explained in Table C.

Table 3d. Spring barley lodging (Ldg) score and plant height (Ht) averages at five South Dakota locations. Table sorted low to high by all location lodging score average.

Variety, Heading [1]	Location Lodging score (Ldg) & Plant height (Ht)										All Locations Average	
	Brookings		South Shore		Miller		Selby		Brown Co.			
	Ldg score	Ht inch	Ldg score	Ht inch	Ldg score	Ht inch	Ldg score	Ht inch	Ldg score	Ht inch	Ldg score	Ht inch
Pinnacle, 3	**1**	32	**1**	31	**1**	30	**1**	**32**	**3**	34	1	32
Stellar-ND, 2	**1**	34	**1**	**33**	**1**	**31**	**1**	**33**	**3**	33	1	33
Rawson, 2	**1**	**36**	**1**	**33**	**1**	**33**	**1**	**32**	**3**	34	1	34
Lacey, 0	**1**	35	**1**	**33**	**1**	**31**	**1**	**35**	**3**	34	1	33
Drummond, 2	**1**	**38**	**1**	**35**	**1**	**32**	2	**33**	**3**	**36**	2	35
Rasmusson, 3	**1**	34	**1**	**33**	2	29	**1**	30	**3**	32	2	31
Robust, 3	**1**	**36**	**1**	**35**	**1**	**33**	2	**35**	**3**	**35**	2	35
Eslick, 3	2	27	**1**	28	2	27	2	30	4	31	2	28
Conlon, 0	**1**	35	**1**	**34**	3	30	3	31	4	**38**	2	33
Test avg. :	1	34	1	33	2	31	2	32	3	34		
High avg. :	2	38	1	35	3	33	3	35	4	38		
Low avg. :	1	27	1	28	1	27	1	30	3	31		
[5] Lsd(.05) :	1	2	NS	2	1	2	1	3	1	3		
[6] TPG-value :	1	36	1	33	1	31	1	32	3	35		
[7] C.V. :	22	4	15	4	37	5	33	6	13	5		

[1] Heading- days earlier or later (- or +) than Lacey, the check variety (Ck) for maturity.
Column values in **bold type** at each location are top-performance group values.
Note that additional table footnotes are explained in Table C.

Table 3e. Origin, traits, and disease reactions for barley varieties tested in 2009
Table sorted early to late maturity by relative heading (Rel Hdg).

Variety	Origin	Rel Hdg [1]	Ldg Res [8]	Grain Use	Awn Texture [9]	Loose Smut [13]	Stem Rust [13]	Blotch [13]		PVP Status [14]
								Spot	Net	
Two-row types:										
Conlon	ND-96	0	G	Malt	SS	S			MR	Yes
Rawson	ND-05	2	F	Feed	SR	S	S	M	MS	Yes
Eslick	MT-04	3	F	Feed	R	S	S	R	MS	No
Pinnacle	ND-07	3	-	-	S					Pdg
Six-row types:										
Lacey	MN-00	0	G	Malt	S	S	S	M	S	Yes
Stellar-ND	ND-05	2	G	Feed	SS	S	S	M	MS	Yes
Drummond	ND-00	2	VG	Malt	SS	S	S	R	MS	Yes
Rasmusson	MN-08	3	G	-	S	S	S	M	S	Pdg
Robust	MN-83	3	G	Malt	S	S	S	M	S	Yes

[1] Heading- days earlier (-) or later than Lacey, the check variety (Ck) for maturity.
Note that additional table footnotes are explained in Table C.

Table 4a. Winter wheat yield results - South Dakota western locations, 2007-2009.
Table is sorted by 3-yr then by 2009 state yield average.

Variety, Heading [1,2]	Location yield averages - Bu/a at 13% moisture												Western Yield Yield avg. bu/a		State Yield Avg. Yield avg. bu/a	
	Kennebec		Wall		Hayes		Sturgis		Winner							
									CPT		IMS*					
	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr
SD06069	**65**	.	**57**	.	50	.	**64**	.	73	.	**81**	.	65	.	66	.
SD05118	**64**	.	48	.	**51**	.	59	.	**80**	.	73	.	63	.	65	.
SD06158	**64**	.	**53**	.	46	.	**62**	.	72	.	**78**	.	63	.	65	.
Expedition, 1	**62**	60	39	**57**	**55**	**64**	58	**43**	**75**	63	**86**	.	63	.	65	.
Smoky Hill, 5	61	.	43	.	50	.	53	.	**81**	.	**81**	.	62	.	65	.
Overland, 5	60	**69**	51	**62**	**51**	**60**	**60**	**42**	73	**67**	**79**	.	62	.	64	.
Wahoo, 4	**70**	**67**	**53**	**59**	49	**60**	**64**	**46**	**74**	59	76	.	64	.	63	.
Darrell, 6	60	60	46	**56**	**54**	**62**	59	**43**	70	57	75	.	61	.	63	.
Wesley, 3	59	**62**	43	**59**	46	58	**60**	**43**	73	61	74	.	59	.	62	.
Settler CL, 4	60	.	45	.	**57**	.	50	.	**77**	.	**83**	.	62	.	62	.
SD06163	**63**	.	44	.	**54**	.	55	.	69	.	73	.	60	.	62	.
NuDakota~W, 4	58	**63**	42	**59**	47	58	53	41	**84**	**72**	**78**	.	60	.	61	.
Millennium, 5	59	**67**	50	**58**	50	59	58	**44**	73	**64**	71	.	60	.	61	.
Infinity CL, 4	58	.	49	.	**55**	.	54	.	73	.	76	.	61	.	61	.
Fuller, 3	53	.	38	.	46	.	55	.	**81**	.	**80**	.	59	.	61	.
SD05W018	51	.	45	.	47	.	50	.	69	.	72	.	56	.	61	.
Wendy~W, 0	46	56	42	**61**	**52**	**63**	50	39	**77**	**64**	72	.	57	.	61	.
Art, 1	47	.	37	.	50	.	50	.	**77**	.	76	.	56	.	60	.
Hatcher, 3	46	55	49	**58**	45	56	65	**46**	**75**	61	**77**	.	60	.	60	.
Radiant, 5	**62**	.	**56**	.	**56**	.	58	.	59	.	65	.	59	.	60	.
Hawken, 4	52	60	39	**58**	47	58	54	41	**75**	**65**	**81**	.	58	.	60	.
Lyman, 4	53	**71**	41	**54**	50	**60**	58	41	**76**	**66**	67	.	58	.	60	.
SD03164-2	48	.	43	.	48	.	56	.	72	.	**78**	.	58	.	60	.
Harding, 6	**63**	66	51	**54**	50	59	**60**	**42**	65	57	64	.	59	.	60	.
Striker, 5	61	.	46	.	**54**	.	50	.	69	.	69	.	58	.	59	.
Jagalene, 4	53	48	36	**54**	46	55	55	41	71	52	**84**	.	58	.	59	.
Arapahoe, 4	59	**66**	46	**56**	**51**	59	57	41	72	61	67	.	59	.	59	.
Jerry, 6	58	58	**55**	**53**	**51**	55	57	**42**	60	51	58	.	57	.	58	.
Alice~W, 0	53	56	38	**56**	47	56	56	41	71	61	75	.	57	.	58	.
AP503CL2, 4	54	.	35	.	49	.	49	.	64	.	76	.	55	.	56	.
Test avg. :	57	62	45	57	50	59	56	42	73	61	75	.	59	.	61	.
High avg. :	70	71	57	62	57	64	65	46	84	72	86	.	65	.	66	.
Low avg. :	46	48	35	53	45	55	49	39	59	51	58	.	55	.	56	.
[5] LSD (0.05):	8	9	5	NS	6	4	5	4	10	8	9		**		**	.
[6] TPG-value :	62	62	52	53	51	60	60	42	74	64	77					.
[7] C.V. :	10	7	7	8	8	8	6	9	10	9	9					.

[1] Heading- days earlier or later (- or +) than Expedition, the check variety (Ck) for maturity. Note that Column values in **bold type** at each location are top-performance group values.
Note that additional table footnotes are explained in Table C.
* Indicates this trial was an intensive management study (IMS).
** A significant variety x location interaction indicates that yield values differed significantly by variety and location, therefore evaluate yield values by location not by the Western and State yield averages.

Table 4b. Winter wheat yield results - South Dakota eastern locations, 2007-2009.
Table is sorted by 3-yr then by 2009 state yield average.

Variety, Heading [1,2}	Location yield averages - Bu/a at 13% moisture												Eastern Yield Yield avg. bu/a		State Yield Avg. Yield avg. bu/a	
	Brookings				Selby		Onida		Pierre		Platte					
	CPT		IMS*													
	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr
SD06069	**75**	.	**86**	.	**78**	.	**48**	.	**43**	.	68	.	66	.	66	.
SD05118	**72**	.	**85**	.	**79**	.	**48**	.	40	.	**79**	.	67	.	65	.
SD06158	**70**	.	**79**	.	**84**	.	**47**	.	**50**	.	**75**	.	68	.	65	.
Expedition, 1	**71**	**65**	**84**	.	70	**71**	**49**	**61**	**46**	**50**	**83**	**75**	67	.	65	.
Smoky Hill, 5	**66**	.	**84**	.	**77**	.	**49**	.	**48**	.	**81**	.	68	.	65	.
Overland, 5	65	**68**	73	.	73	**78**	**52**	**66**	**50**	**58**	**79**	**78**	65	.	64	.
Wahoo, 4	54	**60**	63	.	**75**	**68**	**49**	**59**	**48**	**52**	**81**	**68**	62	.	63	.
Darrell, 6	**72**	**64**	73	.	**76**	**66**	**52**	**61**	**43**	46	73	65	65	.	63	.
Wesley, 3	**68**	**63**	66	.	**75**	**67**	**49**	**63**	**46**	**50**	**83**	**73**	65	.	62	.
Settler CL, 4	63	.	74	.	69	.	**51**	.	**46**	.	72	.	63	.	62	.
SD06163	**67**	.	72	.	**74**	.	43	.	**44**	.	**83**	.	64	.	62	.
NuDakota~W, 4	**67**	**67**	73	.	**75**	**71**	**46**	**62**	42	**50**	71	**73**	62	.	61	.
Millennium, 5	62	**64**	73	.	72	**73**	**47**	**61**	41	**51**	73	**73**	61	.	61	.
Infinity CL, 4	65	.	**78**	.	69	.	**48**	.	37	.	68	.	61	.	61	.
Fuller, 3	**68**	.	**83**	.	72	.	**47**	.	41	.	69	.	63	.	61	.
SD05W018	**75**	.	**81**	.	**74**	.	**46**	.	**48**	.	71	.	66	.	61	.
Wendy~W, 0	**66**	**65**	**79**	.	**77**	**73**	**48**	**62**	**48**	**51**	**79**	**71**	66	.	61	.
Art, 1	**78**	.	76	.	**77**	.	45	.	36	.	72	.	64	.	60	.
Hatcher, 3	58	**60**	**77**	.	68	59	**51**	57	37	43	66	64	60	.	60	.
Radiant, 5	60	.	75	.	**83**	.	**51**	.	**43**	.	52	.	61	.	60	.
Hawken, 4	64	**68**	74	.	**74**	**65**	**50**	**61**	42	45	70	**68**	62	.	60	.
Lyman, 4	**69**	**71**	**81**	.	67	**76**	45	**59**	38	**49**	73	**71**	62	.	60	.
SD03164-2	**71**	.	**78**	.	63	.	44	.	**44**	.	**80**	.	63	.	60	.
Harding, 6	63	**63**	73	.	**77**	**72**	44	**58**	40	**51**	65	**66**	60	.	60	.
Striker, 5	67	.	**77**	.	**78**	.	37	.	38	.	60	.	60	.	59	.
Jagalene, 4	50	50	68	.	70	55	**51**	**58**	**45**	**49**	**76**	60	60	.	59	.
Arapahoe, 4	64	**65**	73	.	71	**70**	44	**59**	34	46	71	**67**	60	.	59	.
Jerry, 6	62	**60**	73	.	**76**	**72**	45	55	33	37	64	61	59	.	58	.
Alice~W, 0	**68**	**62**	**79**	.	62	61	**46**	**60**	39	**48**	67	62	60	.	58	.
AP503CL2, 4	**68**	.	70	.	64	.	41	.	39	.	68	.	58	.	56	.
Test avg. :	66	63	76	.	73	69	47	60	42	49	72	68	63	.	61	.
High avg. :	78	71	86	.	84	78	52	66	50	58	83	78	68	.	66	.
Low avg. :	50	50	63	.	62	55	37	55	33	37	52	60	58	.	56	.
[5] LSD (0.05):	12	11	9		10	14	6	8	7	10	9	12	**	.	**	.
[6] TPG-value :	66	60	77		74	64	46	58	43	48	74	66		.		.
[7] C.V. :	13	9	9		9	7	10	8	11	9	9	9		.		.

[1] Heading- days earlier or later (- or +) than Expedition, the check variety (Ck) for maturity.
Column values in **bold type** at each location are top-performance group values.
Note that additional table footnotes are explained in Table C.
* Indicates this trial was an intensive management study (IMS).
** A significant variety x location interaction indicates that yield values differed significantly by variety and location, therefore evaluate yield values by location not by the Eastern and State yield averages.

Table 4C. Winter wheat grain protein average at eight locations in 2009.
Table is sorted by all-location average.

Variety, Heading [1,2]	Test trial 2009 protein averages at 13% Moisture								All-location avg.
	Winner		Brookings		Selby	Onida	Pierre	Platte	
	CPT	IMS*	CPT	IMS*					
	%	%	%	%	%	%	%	%	%
Art, 1	**15.8**	**16.3**	**13.8**	13.3	**15.0**	**14.5**	**16.4**	**13.3**	14.8
Wesley, 3	**15.5**	15.8	**13.8**	**13.8**	**15.2**	**14.0**	15.4	13.2	14.6
Harding, 6	**15.6**	15.7	13.6	12.8	14.9	**13.6**	15.7	**13.6**	14.4
Lyman, 4	15.0	15.1	13.2	13.1	**15.7**	**14.3**	15.4	**13.5**	14.4
SD03164-2	**15.5**	15.7	13.3	12.9	**15.2**	13.2	15.4	**13.9**	14.4
Jerry, 6	15.2	15.3	13.1	12.5	**15.1**	**14.9**	15.4	**13.5**	14.4
Arapahoe, 4	15.2	15.4	13.5	13.1	14.7	**13.7**	**16.0**	13.1	14.3
Striker, 5	14.9	15.2	13.5	13.1	14.9	**14.1**	**15.9**	12.9	14.3
Hawken, 4	14.9	14.9	**14.4**	**13.6**	14.8	13.4	14.8	13.2	14.2
Wahoo, 4	14.5	14.8	**14.0**	**13.4**	**15.4**	13.5	15.0	**13.3**	14.2
SD06163	**15.8**	**16.0**	13.2	13.1	14.9	12.5	15.3	13.1	14.2
Wendy~W, 0	14.8	15.1	13.6	12.7	**15.1**	**14.0**	15.2	**13.3**	14.2
SD06069	15.0	14.7	13.1	**14.6**	14.6	13.2	15.2	12.7	14.1
Jagalene, 4	14.6	14.5	**14.1**	**13.8**	14.9	**13.9**	14.2	12.9	14.1
Fuller, 3	14.6	14.8	13.6	12.7	**15.1**	**13.7**	15.0	12.9	14.1
SD05118	14.5	15.0	12.7	12.1	**15.3**	**13.9**	15.6	13.2	14.0
Smoky Hill, 5	14.8	14.6	**13.7**	12.9	14.7	13.3	15.0	12.8	14.0
Millennium, 5	14.2	14.5	13.2	12.9	14.8	**13.9**	14.7	13.0	13.9
Alice~W, 0	14.9	15.2	12.6	12.3	**15.1**	13.0	15.3	12.8	13.9
NuDakota~W, 4	14.4	14.8	**13.8**	12.9	14.4	13.0	14.5	12.9	13.8
Expedition, 1	14.5	14.8	12.8	12.6	14.7	13.1	15.1	12.9	13.8
Overland, 5	14.2	14.4	13.2	12.9	**15.0**	13.3	14.3	12.5	13.7
Darrell, 6	14.6	14.8	12.6	12.4	14.7	**13.7**	14.3	12.6	13.7
SD06158	14.6	14.8	12.9	12.5	14.8	12.7	14.5	12.6	13.7
AP503CL2, 4	14.5	14.3	13.2	12.8	14.4	12.9	14.7	11.8	13.6
SD05W018	14.3	14.3	12.8	12.1	14.4	12.9	14.4	12.7	13.5
Radiant, 5	14.0	14.2	12.2	11.0	13.9	**14.3**	15.4	12.5	13.4
Settler CL, 4	13.8	13.9	12.8	12.1	14.5	12.3	14.5	12.6	13.3
Infinity CL, 4	13.9	13.8	12.6	11.8	14.0	12.8	14.5	12.4	13.2
Hatcher, 3	13.7	14.1	12.5	12.0	13.7	13.2	14.0	12.3	13.2
Test avg. :	14.7	14.9	13.2	12.8	14.8	13.5	15.0	12.9	14.0
High avg. :	15.8	16.3	14.4	14.6	15.7	14.9	16.4	13.9	14.8
Low avg. :	13.7	13.8	12.2	11.0	13.7	12.3	14.0	11.8	13.2
[5] LSD (.05):	0.5	0.4	0.7	1.2	0.7	1.3	0.6	0.6	**
[6] TPG-value :	15.3	15.9	13.7	13.4	15.0	13.6	15.8	13.3	
[7] C.V. :	2.0	2.0	4.0	7.0	3.0	7.0	3.0	4.0	

[1] Heading- days earlier or later (- or +) than Expedition, the check variety (Ck) for maturity.
Note that additional table footnotes are explained in Table C.
Column values in **bold type** at each location are top-performance group values.
* Indicates the trial was an intensive management study (IMS).
** A significant variety x location interaction indicates that protein values differed significantly by variety and location, therefore evaluate protein values by location not by the all-location average.

Table 4D. Winter wheat bushel weight averages at eight locations in 2009.
Tables is sorted by all-location average.

Variety, Heading [1,2]	Test trial 2009 bushel weight averages								All-location avg.a
	Winner-IMS	Kennebec	Wall	Hayes	Sturgis	Brookings-IMS	Selby	Platte	
	lb	lb	lb	lb	lb	lb	lb	lb	lb
AP503CL2, 4	**58.7**	**60.5**	**61.0**	**64.4**	**60.5**	57.9	**61.1**	57.9	60.2
Wendy~W, 0	57.7	59.6	**61.7**	63.3	**60.5**	**59.8**	59.1	**58.9**	60.0
SD06069	**58.6**	**60.7**	**61.0**	63.2	.	**59.4**	59.4	57.7	60.0
Infinity CL, 4	58.3	59.5	**61.3**	62.9	59.6	**59.8**	59.2	**59.3**	60.0
Expedition, 1	**58.6**	**60.1**	**61.1**	61.8	59.6	**58.8**	**60.7**	**59.2**	60.0
Smoky Hill, 5	**59.5**	**61.5**	59.9	**63.8**	**60.2**	**58.0**	**59.5**	57.5	59.9
Lyman, 4	57.7	59.7	59.3	62.6	**60.3**	**60.1**	59.0	**59.8**	59.7
SD06158	**58.8**	**61.4**	**60.4**	63.3	**60.2**	57.8	59.1	57.0	59.7
Overland, 5	58.1	59.6	**61.0**	62.8	**61.1**	57.7	59.2	**58.8**	59.6
SD03164-2	**58.8**	59.1	**61.2**	62.5	59.8	**59.2**	57.9	**58.8**	59.6
SD06163	57.8	59.7	**61.2**	62.3	60.0	**58.9**	**59.5**	57.5	59.6
Hawken, 4	58.1	**60.4**	59.3	62.6	59.9	57.5	**60.6**	**58.6**	59.6
Harding, 6	**59.3**	**60.9**	58.4	62.2	.	57.9	59.2	**59.3**	59.6
SD05W018	**58.7**	**59.8**	58.6	63.4	.	**59.5**	58.8	58.1	59.5
Alice~W, 0	57.2	59.4	**61.2**	62.6	**60.2**	**59.0**	58.3	58.1	59.4
Darrell, 6	**59.1**	**59.9**	59.0	62.4	.	57.9	58.7	**59.0**	59.4
Art, 1	57.4	59.7	59.3	63.0	58.4	57.6	**60.3**	**59.0**	59.4
Millennium, 5	**58.6**	**60.9**	**60.5**	62.7	**61.8**	55.8	58.8	57.7	59.3
Striker, 5	57.3	**59.9**	**61.1**	61.9	**60.4**	**58.3**	**60.5**	56.1	59.3
Settler CL, 4	57.7	**59.8**	59.3	62.3	**60.2**	57.9	59.1	**58.9**	59.3
Jagalene, 4	**58.9**	**60.3**	**60.3**	**65.0**	59.8	55.5	58.8	56.4	59.3
SD05118	57.8	59.7	59.9	62.1	**60.4**	**58.2**	59.3	57.4	59.2
Fuller, 3	58.2	59.6	59.0	62.5	59.1	**59.0**	58.8	57.7	59.2
Jerry, 6	56.4	59.4	**61.1**	61.5	**61.3**	56.9	59.2	57.3	58.8
Hatcher, 3	57.6	57.2	**60.7**	62.1	**60.5**	**58.0**	58.6	56.4	58.6
Arapahoe, 4	56.6	59.5	59.1	61.4	.	56.6	58.6	**58.7**	58.6
Radiant, 5	57.5	**60.2**	59.0	**63.8**	**62.0**	53.9	**60.7**	53.8	58.4
Wahoo, 4	56.8	59.2	**61.1**	62.2	58.9	53.1	**59.6**	56.5	58.4
Wesley, 3	56.3	59.2	59.8	62.1	59.3	55.0	58.4	56.6	58.2
NuDakota~W, 4	56.7	57.3	58.9	60.6	57.6	55.1	56.8	54.5	57.1
Test avg. :	58.0	59.8	60.1	62.6	60.1	57.6	59.2	57.7	59.3
High avg. :	59.5	61.5	61.7	65.0	62.0	60.1	61.1	59.8	60.2
Low avg. :	56.3	57.2	58.4	60.6	57.6	53.1	56.8	53.8	57.2
[5] LSD (.05):	1.0	1.7	1.6	1.5	1.8	2.1	1.6	1.3	**
[6] TPG-value :	58.5	59.8	60.1	63.5	60.2	58.0	59.5	58.5	
[7] C.V. :	1	2	2	2	2	3	2	2	

[1] Heading- days earlier or later (- or +) than Expedition, the check variety (Ck) for maturity.
Note that additional table footnotes are explained in Table C.
Column values in **bold type** at each location are top-performance group values.
[a] All-location average does not include Sturgis, where weights for some varieties were missing.
* Indicates the trial was an intensive management study (IMS).
** A significant variety x location interaction indicates that bushel weight values differed significantly by variety and location, therefore evaluate bushel weight values by location not by the all-location average.

Table 4e. Origin, traits, and disease reactions for winter wheat varieties tested in 2009. Table sorted early to late maturity by relative heading (Rel Hdg).

Variety [2]	Rel Hdg [1]	Origin	Ldg Res [8]	Winter Hardy Rtg [8]	End-Use Qlty [10]	Cole-optile Lgth [11]	Wheat Steak Mosaic [13]	Tanspot [13]	Rust [13]			PVP Status [14]
									Stripe	Leaf	Stem	
Alice~W	0	SD-06	G	G	EB	78	MR	MS	-	MS	MR	Yes
Wendy~W	0	SD-04	E	E	GN	67	MS	R	MR	MS	MR	Yes
Art	1	AP-08	E	G	-	-	S	MR	R	R	MR	Yes
Expedition	1	SD-02	F	G-E	GB	88	S	MS	MS	S	R	Yes
Fuller	3	KS-07	F-G	G	AB	-	MS	MR	-	MR	MR	Pdg
Hatcher	3	CO-04	G	F-G	GB	89	S	-	MS	MS	MR	Yes
Wesley	3	NE-98	E	G-E	GB	79	S	MR	MR	MS	R	No
AP503CL2	4	AP-08	E	G-E	-	-	MS	MR	MR	S	MR	Yes
Arapahoe	4	NE-88	F	G-E	GB	83	S	S	MS	MR	MR	Yes
Hawken	4	AP-07	E	G	AB	-	MS	MR	MR	MR	MR	Yes
Infinity CL	4	NE-05	G	G	AB	-	S	-	MR	MR	MR	Yes
Jagalene	4	AP-02	E	G	AB	92	MS	MR	MR	S	MR	Yes
Lyman	4	SD-08	F	G	AB	90	S	MR	MS	R	R	Pdg
NuDakota~W	4	AP-06	E	G-E	AB	-	MR	MR	MR	MS	MR	Yes
Settler CL	4	NE-08	G	G	AB	-	S	-	MS	MS	MR	Pdg
Wahoo	4	NE/WY-01	G	G	AB	91	S	-	MR	MS	R	Yes
Millennium	5	NE-99	G	F-G	AB	78	S	MS	MR	MR	MR	Yes
Overland	5	NE/SD-07	G	E	AB	89	-	-	R	R	MS	Pdg
Radiant	5	CAN-05	E	G-E	AB	-	R	-	S	S	-	-
Smoky Hill	5	WPB-07	G	G	EB	-	MS	MR	R	R	MR	Yes
Striker	5	WB-09	E	E	-	-	-	MS	MR	R	MR	Yes
Darrell	6	SD-06	G	G	EB	89	MR	MS	-	MS	R	Yes
Harding	6	SD-99	F-G	E	AB	100	MR	MR	MS	MR	MR	Yes
Jerry	6	ND-01	F	E	GB	92	MS	-	MR	MR	R	No
SD03164-2	-	SD-	-	-	-	-	-	-	-	-	-	-
SD05118	-	SD-	-	-	-	-	-	-	-	-	-	-
SD05W018	-	SD-	-	-	-	-	-	-	-	-	-	-
SD06069	-	SD-	-	-	-	-	-	-	-	-	-	-
SD06158	-	SD-	-	-	-	-	-	-	-	-	-	-
SD06163	-	SD-	-	-	-	-	-	-	-	-	-	-

[1] Heading- days earlier or later (- or +) than Expedition, the check variety (Ck) for maturity.
Note that additional table footnotes are explained in Table C.

Table 5a. Field pea yield results at three South Dakota locations, 2008-2009. Table sorted by 2-yr then by 2009 state yield average.

Variety, Rel. Mat. [15]	Location Yield Avg. Bu/a at 13% moist.						All Locations Yield Avg. bu/a	
	South Shore		Wall		Selby			
	2009	2-Yr	2009	2-Yr	2009	2-Yr	2009	2-Yr
Spider, M	76	**75**	**32**	.	**95**	**66**	68	71
Cooper, L	**81**	**75**	**33**	.	**96**	**62**	70	69
Arcadia, E	**84**	**76**	**29**	.	**84**	53	66	65
CDC Meadow, E	**80**	**71**	**31**	.	**92**	**59**	68	65
CDC Golden, M	**79**	**71**	**34**	.	**85**	**56**	66	64
CDC Striker, M	64	**64**	**34**	.	**85**	**57**	61	61
SW Midas, E	72	61	**31**	.	81	53	61	57
DS Admiral, E	59	59	**32**	.	77	52	56	56
Thunderbird, M	**87**	.	**30**	.	**86**	.	68	.
Commander, E	**85**	.	**33**	.	**84**	.	67	.
Summit, E	77	.	**30**	.	**90**	.	66	.
Agassiz, E	74	.	**33**	.	81	.	63	.
Korando, M	58	.	**26**	.	78	.	54	.
Sage, E	70	.	**32**	.	71	.	58	.
DS 98244, VE	.	.	**32**	.	.	.	.	.
Test avg. :	75	69	31	.	85	57	64	64
High avg. :	87	76	34	.	96	66	70	71
Low avg. :	58	59	26	.	71	52	54	56
[5] LSD (.05):	9	14	NS		12	10		
[6] TPG-value :	78	62	26		84	56		
[7] C.V. :	8	9	11		10	12		

[15] Maturity- relative to other varieties in the trial.
Note that additional table footnotes are explained in Table C.
Column values in **bold type** at each location are top-performance group values.

Table 5b. Seed source, traits, grain protein and disease reactions for field pea entries tested in 2009.

Variety	Seed Source	Rel Mat [15]	Vine Type [16]	Grain Protein %	Wilt Fuarium Wilt	Powdery Mildew	Mycos-phaerella Blight	PVP or PBR Status [14]
DS 98244	PUSA-09	VE	S-L	-	-	-	-	-
Agassiz	MS-09	E	S-L	24.9	-	R	MS	Yes
Arcadia	LL-07	E	S-L	23.5	MS	MS	VS	Yes
CDC Meadow	ASS-06	E	S-L	23.7	MS	MR	MS	No
Commander	PUSA	E	S-L	24.9	R	MR	-	Yes
DS Admiral	LL-02	E	S-L	23.9	MS	R	MS	Yes
Sage	ASS-05	E	S-L	23.3	MR	MR	MS	Yes
Summit	ASS-09	E	S-L	23.5	R	MR	-	Yes
SW Midas	LL-05	E	S-L	23.6	MS	R	MS	Yes
Korando	PUSA-09	M	S-L	25.8	R	MR	-	Yes
Spider	LL-08	M	S-L	24.9	MR	R	MS	Yes
CDC Golden	ASS-03	M	S-L	25.0	MS	MR	MS	No
CDC Striker	ASS-02	M	S-L	25.2	MR	S	MS	Yes
Thunderbird	MS-09	M	S-L	24.9	MS	MR	MS	-
Cooper	MS-02	L	S-L	23.5	MS	MR	MS	Yes

[15] Maturity- relative to other varieties in the trial.
Note that additional table footnotes are explained in Table C.