

Western Regional Cool Season Legume Evaluation Trials & Nurseries - 2007



Prepared by
Grain Legume Genetics and Physiology Research Unit

U.S. Department of Agriculture
Agricultural Research Service

and

Department of Crop and Soil Sciences
Washington State University
Pullman, WA 99164-6434

Table of Contents

Acknowledgments	ii
Cooperators	1
Project Description and Objectives	3
Spring Pea Trials	4
Winter Pea Trials	31
Lentil Trials	38
Winter Lentil Trials	48
Chickpea Trials	55

Acknowledgements

We would like to acknowledge contributions of the Cool Season Food Legume Program to the Grain Legume Variety Development program.

Cooperators

University of Idaho

Doug Finkelnburg
Support Scientist
Dep. of PSES
University of Idaho
Phone: (208)885-5965
E-Mail: dougf@uidaho.edu

Stephen Guy
Department of Plant & Soil Sciences
Entomology
Moscow, ID 83843-2339
(208) 885-6744
sguy@uidaho.edu

Montana State University

Chengci Chen
Central Agricultural Research Center
HC90 Box 20
Mocassin, MT 59462
(406) 423-5421
cchen@montana.edu

Jeff Holmes
Department of Land Resources & Environmental
Sciences
PO Box 173120
Bozeman, MT 59717-3120
(406) 994-5119
jholmes@montana.edu

Duane Johnson
Northwestern Agricultural Research Center
4570 Mt. 35
Kalispell, MT 59901
(406) 755-4303
duanej@montana.edu

Perry Miller
Department of Land Resources & Environmental
Sciences
PO Box 173120
Bozeman, MT 59717-3120
(406) 994-5431
pmiller@montana.edu

Karnes Neill
Central Agricultural Research Center
HC90 Box 20
Mocassin, MT 59462
(406) 423-5421
kneill@montana.edu

Louise Strang
Northwestern Agricultural Research Center
4570 Mt. 35
Kalispell, MT 59901
(406) 755-4303
lmstrang@montana.edu

University of Nebraska

Carlos A. Urrea
Dry Bean Breeding Specialist
Panhandle Research & Extension Center
University of Nebraska- Lincoln
4502 Avenue I
Scottsbluff, NE 69361
currea2@unlnotes.unl.edu

North Dakota State University

Erik Ericksmoen
Hettinger Research & Extension Center
102 Hwy 12 W, PO Box 1377
Hettinger, ND 58639
(701) 567-4323
Eric.Eriksmoen@ndsu.nodak.edu

Mark Halvorson
North Central Research & Extension Center
5400 Highway 83 S
Minot, ND 58701-7645
(701) 857-7677
Mark.Halvorson@nds.u.nodak.edu

Randy Mehlhof
(701) 256-2582
Randall.Mehlhoff@nds.u.nodak.edu

Neil Riveland
Williston Research Extension Center
14120 Hwy 2
Williston, ND 58801
(701) 774-4315
Neil.Riveland@nds.u.nodak.edu

Blaine Schatz
Carrington Research Extension Center
663 Hwy 281 N, PO Box 219
Carrington, ND 58421
(701) 652-2951
Blaine.Schatz@nds.u.nodak.edu

Steve Zwinger
Carrington Research Extension Center
663 Hwy 281 N, PO Box 219
Carrington, ND 58421
(701) 652-2951
Steve.Zwinger@nds.u.nodak.edu

South Dakota State University
John Rickertsen
West River Agricultural Center
1905 Plaza Blv
Rapid City, SD 57702-9302
(605) 394-2236
rickertsen.john@ces.sdstate.edu

USDA, Agricultural Research Service
George Vandemark
USDA-ARS-GLGP
303 Johnson Hall
Pullman, WA 99164-6434
(509) 335-7728
george.vandemark@ars.usda.gov

Fred Muehlbauer
USDA-ARS-GLGP
303 Johnson Hall
Pullman, WA 99164-6434
(509) 335-9521
muehlbau@wsu.edu
Kevin McPhee
USDA-ARS-GLGP
303 Johnson Hall
Pullman, WA 99164-6434
(509) 335-9522
kevin.mcphee@ars.usda.gov

Jarrold Pfaff
USDA-ARS-GLGP
303 Johnson Hall
Pullman, WA 99164-6434
(509) 335-8737
jarrod.pfaff@ars.usda.gov

University of Wyoming
Jack Cecil
UW SAREC
2753 State Highway 157
Lingle, WY 82223
(307) 837-2000
jtcecil@uwyo.edu

Central Washington Grain Growers
Howard Nelson
PO Box 426
Wilbur, WA 99185
Phone: 509-647-5510
Fax: 509-647-2025

Project Description and Objectives

New varieties of cool season food legumes are needed by the expanding industry in the northern plains region as well as the Pacific Northwest. Candidate varieties are being developed by the USDA-ARS Grain Legume Genetics program located at Washington State University; however, the germplasm being generated needs to be evaluated in all production regions. Specifically, new varieties are needed that are better adapted to the northern plains and with improved disease resistance, yields and quality. Potential new varieties of dry peas, lentils and chickpeas were evaluated through a coordinated set of trials, the Western Regional Evaluation Trials, in the major production zones of the northern plains and the Pacific Northwest. These trials compared currently available varieties to the most recent material from the USDA-ARS breeding program in uniform replicated trials. Winter hardy pea and lentil selections with high yield potential were also evaluated. In addition to evaluation of advanced breeding lines at locations throughout the northern plains and the Pacific Northwest, nurseries were established to evaluate early-generation segregating breeding populations of chickpea and spring and winter pea and lentil in North Dakota and to make selections for resistance to prevalent diseases, agronomic adaptation and suitable plant types. Screening winter pea and lentil breeding populations in North Dakota will provide an opportunity to identify selections with increased winter hardiness. The goal of this project is to provide producers throughout the U.S. with higher yielding disease resistant varieties that will increase overall farm productivity and profitability while expanding the use of grain legumes in crop rotations. Data and information generated are being made available through websites, meetings, conferences and in printed documents.

- Objective 1: Identify regions of adaptation for new cultivars and breeding lines through establishment of a network of Western Regional Evaluation Trials in the target environments. Informed selection of varieties for production depends on an understanding of how environments differentiate among genetic material. This information is also important to plant breeders in order to optimize the choice of parents, methods of selection and the extent of yield testing in the target region.
- Objective 2: Establish a satellite breeding program in North Dakota to identify early generation breeding lines for potential use in the northern plains region. A range of diseases and environmental stresses are specific to the northern plains region and therefore the prospects for successful selection of adapted high yielding disease resistant germplasm would be most effective if carried out in the target region.

During the 2007 crop year, 32 Western Regional Trials were established at 12 sites in 7 states including 7 for spring dry pea, 5 for spring lentil, 10 for chickpea, 6 for winter dry pea, and 4 for winter lentil. Several sites were lost due to various environmental factors including hail and severe cold temperatures resulting in poor stands in the winter legume trials. Overall, data were collected and received for 28 of the 32 trials. In addition, selections were made in the segregating populations of pea, lentil and chickpea for favorable agronomic adaptation and disease resistance. Replicated yield testing of the earliest pea selections will begin in 2008.

Spring Pea Trials

Twelve spring pea entries in the Western Regional Yield Trial were evaluated at 7 locations across three states in 2007 (Table 1). The entries comprised four checks and eight breeding lines including seven green and three yellow cotyledon types. The checks were 'Stirling', 'Medora', 'Delta' and 'DS-Admiral'. The trials were conducted primarily under dryland conditions. Information regarding experimental design, location and specific observations for some of the locations are included for each trial if provided.

Overall means are presented for each entry based only on Carrington, Minot, and Williston, ND and Wall, SD (Table 2). Average yield for the checks was 2292 lb/a. Stirling, a recently released upright green cotyledon variety, produced an average yield of 2568 lb/a. Yield for 'Medora', new green cotyledon upright variety tested at five locations averaged 1846 lb/a. The highest yielding breeding lines were PS03101822 (yellow) (3079 lb/a) followed by PS03100278 (yellow) (2863 lb/a) and PS03101340 (green) (2791 lb/a).

Table 1. Summary of Locations Participating in the 2007 Spring Pea Western Regional Yield Trial.

Location	Contact	Conditions	Nurseries		
			Seed Sent	Data Returned	Data Lost
<i>Idaho</i>					
Moscow	Stephen Guy	Dryland	✓	✓	
Nezperce	Stephen Guy	Dryland	✓	✓	
Genesee	Stephen Guy	Dryland	✓	✓	
<i>Montana</i>					
Moccasin	Chengci Chen, Karnes Neill	Dryland	✓	✓	
<i>North Dakota</i>					
Carrington	Blaine Schatz, Steve Zwinger	Dryland	✓	✓	
Hettinger	Eric Eriksmoen	Dryland	✓	✓	
Minot	Mark Halvorson	Dryland	✓	✓	
Williston	Neil Riveland	Dryland	✓	✓	
<i>South Dakota</i>					
Wall	John Rickertsen	Dryland	✓	✓	
Grand Totals			9	9	0

Table 2. Location Yield Summary (lbs/a) for Western Regional Spring Pea Trials- 2007.

Name	Nezperce, ID	Moscow, ID	Moccasin, MT	Carrington, ND	Minot, ND	Williston, ND	Wall, SD	Mean
DELTA DS	940	2290	1627	...	...	...	...
ADMIRAL	...	...	...	3084	2024	3006	1740	2463
MEDORA	...	...	1007	2040	1098	2930	1314	1846
PS0010836	700	2510	1551	3138	2450	3386	1920	2724
PS01102958	...	...	218	3552	1998	3164	1476	2547
PS02100107	800	2050	195	3012	2270	3165	1788	2559
PS03100278	...	...	206	3090	2825	3412	2124	2863
PS03100280	...	...	1549	2976	2585	3332	2244	2784
PS03101340	1040	2750	1486	2994	2670	3404	2094	2791
PS03101445	950	2680	1408	3162	2141	3403	1758	2616
PS03101459	880	2210	1301	2376	1235	3208	1770	2147
PS03101822	...	...	1562	3600	2987	3479	2250	3079
STIRLING	920	2380	1360	3240	1904	3262	1866	2568

Table 3. Post Harvest Quality Evaluations of Dry Pea Lines in the Western Regional Dry Pea Trials-2007.

Name	100 Seed Weight	Hard Seed	Water Uptake	Cooking Time	Conductivity	Post Soak Seed Color	Post Soak Bleach	Post Cook Seed Color	Post Cook Broth Color	Seed Coat Separates	Cooked to Mush
<i>Green Peas</i>											
STIRLING	18.1	2	108	21	19	G	2.3	G	5	N	N
PS03101340	22.6	0	111	23	16	G	2.3	G	5	N	N
PS03101459	19.9	1	112	20	14	G	2.7	G	5	N	N
PS02100107	19.0	0	114	19	15	G	2.7	G	5	N	N
PS03101445	18.9	1	115	22	16	G	0.0	G	5	N	N
MEDORA	16.2	1	116	23	25	G	3.7	G	5	N	N
GRAND											
MEAN	19.7	0.8	113	21	17		2.3				
CV	2.79	95.50	2.37	4.05	5.80		66.42				
LSD	0.9	1	5	2	2		2.8				
<i>Yellow Peas</i>											
PS03100278	21.5	1	109	20	38	G	NA	G	5	N	N
PS03101822	22.7	0	109	19	24	G	NA	G	5	N	N
PS0010836	21.4	1	113	17	26	G	NA	G	5	N	N
PS03100280	21.4	0	115	19	26	G	NA	G	5	N	N
PS01102958	22.0	0	118	21	30	G	NA	G	5	Y	N
DELTA	20.0	0	124	20	16	G	NA	G	5	N	N
DS											
ADMIRAL	19.2	0	128	21	28	G	NA	G	5	Y	N
GRAND											
MEAN	21.6	0.3	116.61905	19.52381	27.04762						
CV	3.55	197.20	7.60	5.32	4.83						
LSD	1.3	1	16	2	2						

Seed used for post harvest quality evaluations was grown at Pullman, WA in 2007.

Conductivity is expressed as microsiemens per gram of seed.

Post Seed Soaking Color Evaluation: G = Good; F = Fair; P = Poor.

Cooking time determined by removing a small sub-sample at two minute intervals and mashed with a fork until deemed cooked.

Post Cooking Seed Color is rated as: G = Good; F = Fair; P = Poor.

Post Cooking Broth Color is rated as: 4 = dark; 5 = Light; 6 = Muddy.

Seed Coat Separates From Cotyledon (Sloughs) During Cooking: Y = Yes; N = No.

Seed Cooks To Mush (Looses Rigidity And Individual Seed Identity): Y = Yes; N = No.

Cooking tests conducted on each of three seed lots soaked for 20 hours. All data in the above table is the average of three 100 seed sub-samples.

Table 4. Green Dry Pea Variety Performance Results, Moscow, ID-2007.
Data from Stephen Guy, University of Idaho.

Variety/Selection	Seed Yield	Seed Weight	Vine Length	Canopy Height	Erect Index*
	lb/acre	g/100	inches	inches	0.0-1.0
Aragorn	2410	18.5	29	27	1.0
Ariel	2280	16.2	28	26	0.9
Camry	2410	21.5	19	18	1.0
Columbian	2430	17.5	41	17	0.4
Cooper	2250	22.9	25	25	1.0
Cruiser	2300	18.1	28	27	0.9
Joel	2440	18.3	41	16	0.4
Karita	2450	22.4	25	25	0.1
K2	2340	18.1	26	25	1.0
Medora	2310	18.8	31	30	0.9
Monarch	2680	17.0	22	20	0.9
Pacifica	2360	20.4	30	28	1.0
Stirling	2380	18.1	19	18	1.0
Stirling NST	2370	17.9	22	19	0.9
Pro 031-7053	2810	17.8	30	28	1.0
PS03101340	2750	22.4	30	26	0.9
PS02100107	2050	18.7	23	21	0.9
PS03101459	2210	19.0	28	25	0.9
PS03101445	2680	18.3	26	24	1.0
Pro 031-6229	2280	15.9	26	24	0.9
Pro 041-7109	2200	16.4	25	24	1.0
Average	2400	18.8	27	23	0.9
LSD (0.10)	143	0.6	3	2	0.1
CV (%)	5	2.5	10	8	8.4

* means canopy height/vine length; 1.0=upright

Table 5. Yellow Dry Pea Variety Performance Results, Moscow, ID-2007.
Data from Stephen Guy, University of Idaho.

Variety/Selection	Seed Yield	Seed Weight	Vine Length	Canopy Height	Erect Index*
	lb/acre	g/100	inches	inches	0.0-1.0
Carousel	2450	21.5	27	27	1.0
Delta	2290	19.5	22	21	1.0
Rex	2710	22.7	24	24	1.0
Rex NST	2680	23.0	26	24	0.9
Shawnee	2300	19.2	34	13	0.4
Topeka	2580	20.4	21	19	0.9
Universal	2700	19.6	27	26	1.0
PS0010836	2510	21.6	20	18	0.9
Pro 053-7072	2590	22.9	28	27	1.0
Average	2530	21.2	25	22	0.9
LSD (0.10)	143	0.6	3	2	0.1
CV (%)	5	2.5	10	8	8.4

* means canopy height/vine length; 1.0=upright

Table 6. Yellow Dry Pea Variety Performance Results, Nezperce, ID-2007.
 Data from Stephen Guy, University of Idaho

Variety/Selection	Seed Yield	Seed Weight	Vine Length	Canopy Height	Erect Index*
	lb/acre	g/100	inches	inches	0.0-1.0
Carousel	740	16.6	24	23	1.0
Delta	940	14.3	19	19	1.0
Rex	950	15.2	21	21	1.0
Rex NST	1140	16.4	21	21	1.0
Shawnee	1020	15.3	30	13	0.4
Topeka	920	15.6	20	16	1.0
Universal	1160	15.1	22	22	1.0
PS0010836	700	17.1	16	16	1.0
Pro 053-7072	880	15.6	25	25	1.0
Average	940	15.2	22	20	0.9
LSD (0.10)	142	1.4	3	2	0.1
CV (%)	13	7.8	11	7	6.2

* means canopy height/vine length; 1.0=upright

Table 7. Combined Green Dry Pea Variety Performance Data, Nezperce and Moscow, ID-2007.
Data from Guy Stephen, University of Idaho.

Variety or Selection	Seed Yield			Seed Weight			Average of 2 sites	
	Nezperce	Moscow	Average	Nezperce	Moscow	Average	Vine Length	Canopy Height
	-----lb/acre-----			-----g/100-----			inches	inches
Aragorn	1010	2410	1710	15.7	18.5	17.1	25	24
Ariel	900	2280	1590	13.4	16.2	14.8	24	23
Camry	670	2410	1540	15.6	21.5	18.6	16	16
Columbian	980	2430	1710	13.6	17.5	15.5	34	15
Cooper	650	2250	1450	20.6	22.9	21.7	22	22
Cruiser	870	2300	1580	15.6	18.1	16.8	26	24
Joel	1030	2440	1740	14.8	18.3	16.6	37	15
Karita	770	2450	1610	16.3	22.4	19.3	23	23
K2	750	2340	1550	15.1	18.1	16.6	24	23
Medora	760	2310	1540	15.9	18.8	17.3	28	27
Monarch	1180	2680	1930	13.8	17.0	15.4	20	19
Pacifica	940	2360	1650	15.9	20.4	18.2	26	25
Stirling	920	2380	1650	14.0	18.1	16.1	17	17
Stirling NST	960	2370	1670	14.3	17.9	16.1	19	18
Pro 031-7053	980	2810	1900	11.8	17.8	14.8	28	27
PS03101340	1040	2750	1900	18.4	22.4	20.4	27	24
PS02100107	800	2050	1430	14.9	18.7	16.8	21	20
PS03101459	880	2210	1550	15.0	19.0	17.0	25	24
PS03101445	950	2680	1820	14.1	18.3	16.2	24	23
Pro 031-6229	840	2280	1560	13.1	15.9	14.5	23	22
Pro 041-7109	800	2200	1500	12.2	16.4	14.3	23	22
Average	890	2520	1650	15.0	18.8	16.9	24	22
LSD (0.10)	142	143	101	1.4	0.6	0.7	2	1
CV (%)	13	5	-	7.8	2.5	-	-	-

Table 8. Combined Yellow Dry Pea Variety Performance Data, Nezperce and Moscow, ID-2007.
Data from Guy Stephen, University of Idaho.

Variety or Selection	Seed Yield			Seed Weight			Average of 2 sites	
	Nezperce	Moscow	Average	Nezperce	Moscow	Average	Vine Length	Canopy Height
	-----lb/acre-----			-----g/100-----			inches	inches
Carousel	740	2450	1600	16.6	21.5	19.0	26	25
Delta	940	2290	1620	14.3	19.5	16.9	21	20
Rex	950	2710	1830	15.2	22.7	18.9	22	22
Rex NST	1140	2680	1910	16.4	23.0	19.7	24	22
Shawnee	1020	2300	1660	15.3	19.2	17.3	32	13
Topeka	920	2580	1750	15.6	20.4	18.0	20	18
Universal	1160	2700	1930	15.1	19.6	17.3	24	24
PS0010836	700	2510	1600	17.1	21.6	19.3	18	17
Pro 053-7072	880	2590	1740	15.6	22.9	19.3	26	26
Average	940	2530	1740	15.2	21.2	18.4	24	21
LSD (0.10)	142	143	101	1.4	0.6	0.7	2	0.1
CV (%)	13	5	-	7.8	2.5	-	-	-

Table 9. Seed Yield Averages for Green and Yellow Dry Pea Varieties Tested for Three Years in Northern Idaho.
Data from Stephen Guy, University of Idaho.

Variety/Selection	2005	2006	2007	Average
-----lb/acre-----				
<u>Green pea</u>				
Aragorn	1990	2130	1710	1940
Ariel	1900	2040	1590	1840
Camry	1985	1940	1540	1820
Columbian	1610	1710	1710	1680
Cooper	1875	1550	1450	1630
Cruiser	1790	2020	1580	1800
Joel	1770	1930	1740	1810
Karita	1875	2210	1610	1900
K2	1940	2060	1550	1850
Monarch	2245	1970	1930	2050
Pacifica	1945	2230	1650	1940
Stirling	2050	2180	1650	1960
Pro 031-7053	2050	2100	1900	2020
Average	1930	2010	1660	1870
LSD (0.10)	90	135	101	--
<u>Yellow pea</u>				
Carousel	1900	2120	1600	1870
Delta	2100	2240	1620	1990
Rex	2100	2280	1830	2070
Shawnee	1720	2130	1660	1840
Topeka	2220	2250	1750	2070
Universal	2140	2410	1930	2160
PS0010836	2100	2100	1610	1940
Average	2040	2220	1710	1990
LSD (0.10)	90	135	101	--

Table 10. No-till Dry Pea Variety Performance Results, Genesee, ID-2007.
 Data from Stephen Guy, University of Idaho.

Variety/Selection	Seed Yield	Seed Weight	Vine Length	Canopy Height	Erect Index*
	lb/acre	g/100	inches	inches	0.0-1.0
Aragorn	1990	19.2	23	23	1.0
Camry	1550	22.2	15	16	1.0
Columbian	1840	17.3	29	15	0.5
Cooper	820	23.9	23	23	1.0
Cruiser	1860	18.6	25	24	1.0
Joel	2040	18.5	30	14	0.4
Karita	2010	23.4	23	22	1.0
K2	2030	18.7	25	24	1.0
Monarch	2150	19.0	18	16	0.9
Pacifica	1970	20.8	26	23	0.9
Pacifica NST	1540	19.9	24	22	0.9
Stirling	1730	18.6	19	17	0.9
Stirling NST	1640	18.3	20	17	0.9
Pro 031-7053	2330	18.5	24	23	1.0
Carousel	2070	22.5	27	24	0.9
Rex	1980	22.9	26	20	0.8
Rex NST	1760	23.8	23	18	0.8
Shawnee	2150	20.2	28	12	0.5
Topeka	1970	21.7	17	17	1.0
Universal	2340	19.6	25	23	0.9
Average	1890	20.0	23	20	0.9
LSD (0.10)	240	0.9	4	2	0.1
CV (%)	11	3.6	13	9	10.0

* means canopy height/vine length; 1.0=upright

Table 11. No-till Dry Pea Variety Performance Results, Moscow, ID 2007.
 Data from Stephen Guy, University of Idaho.

Variety/Selection	Seed Yield	Seed Weight	Vine Length	Canopy Height	Erect Index*
	lb/acre	g/100	inches	inches	0.0-1.0
Aragorn	2160	18.6	29	29	1.0
Camry	2620	21.6	23	24	1.0
Columbian	1910	17.1	44	17	0.4
Cooper	2440	25.9	28	29	1.0
Cruiser	2190	17.8	29	27	1.0
Joel	1870	19.6	38	14	0.4
Karita	2240	23.2	30	28	0.9
K2	2200	18.7	28	28	1.0
Monarch	2240	17.2	24	23	1.0
Pacifica	2310	20.6	32	28	0.9
Pacifica NST	2170	20.8	31	28	0.9
Stirling	2330	19.1	22	22	1.0
Stirling NST	2260	18.9	23	21	0.9
Pro 031-7053	2210	17.2	31	29	1.0
Carousel	2340	22.3	33	30	0.9
Rex	2330	22.0	29	18	0.7
Rex NST	2350	22.5	24	23	1.0
Shawnee	1860	19.3	37	11	0.3
Topeka	2680	19.6	24	23	1.0
Universal	2490	19.2	31	30	1.0
Average	2260	20.1	29	24	0.9
LSD (0.10)	201	0.7	4	4	0.1
CV (%)	7	3.1	12	13	11.31

* means canopy height/vine length; 1.0=upright

Table 12. Combined No-till Dry Pea Variety Performance Data, Genesee and Moscow, ID-2007.
Data from Stephen Guy, University of Idaho.

Variety or Selection	Seed Yield			Seed Weight			Average of 2 Sites		
	Genesee	Moscow	Average	Genesee	Moscow	Average	Vine Length	Canopy Height	Erect Index*
	-----lb/acre-----			-----g/100-----			inches	inches	0.0-1.0
Aragorn	1990	2160	2080	19.2	18.6	18.9	26	26	1.0
Camry	1550	2620	2090	22.2	21.6	21.9	19	20	1.0
Columbian	1840	1910	1880	17.3	17.1	17.2	36	16	0.4
Cooper	820	2440	1630	23.9	25.9	24.9	25	26	1.0
Cruiser	1860	2190	2030	18.6	17.8	18.2	27	25	1.0
Joel	2040	1870	1960	18.5	19.6	19.0	34	14	0.4
Karita	2010	2240	2130	23.4	23.2	23.3	26	25	1.0
K2	2030	2200	2120	18.7	18.7	18.7	27	26	1.0
Monarch	2150	2240	2200	19.0	17.2	18.1	21	19	0.9
Pacifica	1970	2310	2140	20.8	20.6	20.7	29	25	0.9
Pacifica NST	1540	2170	1860	19.9	20.8	20.4	28	25	0.9
Stirling	1730	2330	2030	18.6	19.1	18.8	21	20	0.9
Stirling NST	1640	2260	1950	18.3	18.9	18.6	21	19	0.9
Pro 031-7053	2330	2210	2270	18.5	17.2	17.9	28	26	1.0
Carousel	2070	2340	2210	22.5	22.3	22.4	30	27	0.9
Rex	1980	2330	2160	22.9	22.0	22.4	27	19	0.7
Rex NST	1760	2350	2060	23.8	22.5	23.1	23	21	0.9
Shawnee	2150	1860	2010	20.2	19.3	19.8	32	12	0.4
Topeka	1970	2680	2330	21.7	19.6	20.6	20	20	1.0
Universal	2340	2490	2420	19.6	19.2	19.4	28	27	0.9
Average	1890	2260	2080	20.4	20.1	20.2	26	22	0.9
LSD (0.10)	240	201	156	0.9	0.7	0.6	3	2	0.1
CV (%)	11	7	-	3.6	3.1	-	-	-	-

* means canopy height/vine length; 1.0=upright

Table 13. Seed Yield and Seed Weight for No-till Dry Pea Varieties Tested for Three Years in Northern Idaho. Data from Stephen Guy, University of Idaho.

Variety or Selection	Seed Yield				Seed Weight			
	2005	2006	2007	Average	2005	2006	2007	Average
	-----lb/acre-----				-----g/100-----			
Camry	2480	1390	2090	1990				
Columbian	1560	1660	1880	1700	18.7	18.0	17.2	18.0
Cooper	2290	1390	1630	1770				
Cruiser	2000	1470	2030	1830	17.9	18.5	18.2	18.2
Joel	1780	1690	1960	1810	19.7	20.1	19.0	19.6
Karita	2150	1470	2130	1920	22.8	23.7	23.3	23.3
K2	1990	1500	2110	1870	18.5	19.8	18.7	19.0
Monarch	2230	1790	2200	2070	18.6	18.0	18.1	18.2
Stirling	2030	1530	2030	1860	18.9	18.6	18.8	18.8
Carousel	2075	1490	2210	1930				
Rex	1900	1590	2160	1880	21.6	21.7	22.4	21.9
Shawnee	1720	1600	2010	1780	19.8	19.6	19.8	19.7
Topeka	2310	1740	2330	2130	21.0	20.4	20.6	20.7
Average	2000	1560	2060	1890	20.1	20.5	19.6	19.7
LSD (0.10)	160	117	156	-	0.5	0.8	0.6	-

Table 14. Western Regional Spring Pea Evaluations, Agronomic Summary, Moccasin MT-2007.
Data from Chengci Chen and Karnes Neill, Central Ag Research Center.

Selection	Canopy Height	Yield	Moisture	Grain Weights	
				Test	Kernel
Majoret	54.3 ^a	1290	11.5	64.4	185.8
Delta	52.8	1627 ^a	12.1 ^a	65.0 ^a	202.1
Stirling	45.5	1360	11.0	63.4	178.3
Medora	58.0 ^a	1007	11.6	63.3	167.1
PS0010836	45.3	1551 ^a	11.6	63.4	213.3
PS01102958	44.3	1409 ^a	11.7 ^a	64.6	218.1
PS02100107	47.8	1495 ^a	11.3	64.0	194.6
PS03100278	57.0 ^a	1440 ^a	11.0	64.0	206.0
PS03100280	55.5 ^a	1549 ^a	11.3	64.3	209.6
PS03101340	59.0 ^a	1486 ^a	10.9	62.8	235.5 ^a
PS03101445	54.3 ^a	1408 ^a	11.2	63.3	178.4
PS03101459	56.5 ^a	1301	11.6	64.4	187.4
PS03101822	45.8	1562 ^a	11.4	63.4	218.0
Means (<i>n</i> = 52)	52.0	1422	11.4	63.9	199.5
LSD _{0.05} (by t)	6.0	237	0.4	0.4	8.0
C.V.% (s/means)	8.02	11.63	2.71	0.48	2.8
F-Value (12, 36 df)	6.88	3.81	4.6	18.33	49.43

^a - denotes values equal to the largest value (in **bold**) based on LSD_{0.05}.

Table 15. Western Regional Dry Pea Line Evaluations, Management Summary, Moccasin MT-2007. Data from Chengci Chen and Karnes Neill, Central Ag Research Center.

Field Summary		
Environment:	Dryland	
Tillage History:	No-Till	
Previous Crop:	Spring Barley	
Soil Type:	Judith Clay-loam; Fine-loamy; carbonatic Typic Calciboroll	
Elevation:	4300'	
Trial Management		
Seeding Date:	Pea/Lentil: 4/24/2007	Chickpea: 4/25/2007
Fertilizer:	None	
Plot Dimensions:	5-rows x 11" spacing x 20'	
Pesticides: (rates)	RT 3 (16oz/acre) + ProwlH ₂ O (2pt/acre) - Fall App (11/07/06) - Pea/Lentil Assure II (10oz/acre) - Post Emergence (5/17/07) - All Quadris (12 oz/acre) - (6/12 & 6/26/07) - on Chickpeas; Ascochyta present	
Harvest Date:	Pea: 7/25/07	Lentil: 7/27/07 Chickpea: 8/21/07
	- Using a 5' plot harvester - At grain maturity	
Precipitation:	8.32"	Pea/Lentil - April 24 - July 25, 2007
	9.06"	Chickpea - April 24 - Aug 21, 2007
	6.87"	- April 1 - July 31 (98-Yr Average)

Table 16. NDSU Carrington Research Extension Center Dry Pea Preliminary Trials, Carrington, ND-2007. (0706)

Data from Blaine Schatz and Steve Zwinger, North Dakota State University.

Obs	Variety	Days to Bloom	Bloom Duration	Days to PM	Vine Length Cm	Canopy Ht at Harvest Cm	Height Index %	Lodging at PM 0-9	Harvest Ease 0-9	Seed Protein %	Seeds/Pound	1000 KWT Gms	Test Weight Lbs/bu	Seed Yield Bu/ac
1	Cruiser	53.0	14.7	82.7	51.3	46.0	90.1	1.3	2.3	24.8	2234	205	64.9	35.6
2	DS Admiral	52.0	14.0	82.0	60.0	57.3	95.9	1.3	1.5	23.9	1965	231	64.7	45.4
3	Eclipse	54.0	13.0	83.0	50.3	36.0	72.6	2.7	4.3	24.5	1854	245	65.2	57.2
4	Majoret	53.0	13.0	85.7	49.7	44.0	89.0	1.7	2.0	24.9	2180	208	64.9	42.2
5	Medora	54.7	13.7	84.0	54.7	45.7	84.0	2.0	3.0	23.5	2105	216	64.0	36.1
6	PS03100116	54.0	14.7	86.0	49.7	26.3	54.3	3.7	7.0	24.1	2327	195	65.4	38.6
7	PS03100278	48.7	16.3	81.3	47.0	36.7	78.7	3.3	5.0	24.3	2162	210	65.1	47.7
8	PS03100280	49.0	16.7	81.0	49.7	29.3	60.9	4.0	6.3	24.8	2104	216	64.9	43.6
9	PS03100411	51.3	15.3	81.3	43.3	20.0	46.3	4.3	7.7	24.2	1919	237	63.8	53.7
10	PS03101340	47.0	17.3	81.0	47.3	29.7	62.9	3.3	6.3	23.6	1723	264	63.9	50.0
11	PS03101349	49.0	18.3	80.7	46.3	32.7	70.6	3.3	5.3	25.4	2112	215	64.4	47.8
12	PS03101445	51.7	15.0	81.7	45.0	34.7	76.7	3.3	5.3	24.3	2379	191	64.4	51.6
13	PS03101815	50.7	14.3	80.3	49.0	18.0	37.0	4.3	8.3	26.4	1881	242	63.4	50.3
14	PS03101822	50.7	14.0	80.3	48.7	16.0	34.3	4.7	8.0	23.2	2050	222	63.5	57.0
15	PS03101867	53.0	13.3	80.7	49.3	20.0	39.7	4.3	7.0	26.8	2507	181	64.1	50.3
16	PS03690293	50.3	14.7	80.7	42.3	28.7	68.4	3.7	6.3	23.4	2307	197	63.3	43.9
17	PS04100453	53.3	13.7	81.7	48.7	40.7	83.8	2.3	3.7	24.6	2031	224	64.8	47.2
18	PS04100543	53.0	14.7	82.7	47.3	24.7	52.2	4.3	7.7	25.9	2133	213	64.3	48.4
19	PS04100722	54.0	11.0	81.7	50.0	28.7	58.1	3.3	5.7	26.6	1815	250	63.9	51.6
20	PS04100783	54.0	12.0	80.7	43.0	13.3	32.3	4.7	8.7	25.3	2551	179	63.6	47.8
	MEAN	51.8	14.5	82.0	48.6	31.4	64.4	3.3	5.6	24.7	217	2117	64.3	47.3
	C.V.%	2.2	15.5	2.2	11.8	29.9	30.1	22.9	27.1	3.2	5.2	5.4	0.6	9.4
	LSD.05	1.9	NS	3.0	NS	15.6	32.2	1.3	2.5	1.3	18.7	189	0.6	7.4
	LSD.01	2.6	NS	4.0	NS	21.0	43.4	1.7	3.4	1.8	25.1	255	0.8	9.9
	#REPS	3	3	3	3	3	3	3	3	3	3	3	3	3

Planting Date = April 26 ; Harvest Date = August 1 ; Previous Crop = Spring Wheat

Harvest Ease scores; 0 = all plants upright ~ very easy harvest, to 9 = all plants flat ~ very difficulty to harvest direct.

Harvest Index; Plant height at time of harvest relative to plant height at end of bloom.

Table 17 NDSU Carrington Research extension Cneter Dry Pea Preliminary Trials-2007.

Data from Blaine Schatz and Steve Zwinger, North Dakota State University,

Obs	Variety	Days to Bloom	Bloom Duration	Days to PM	Vine Length	Canopy Ht at Harvest	Height Index	Lodging at PM	Harvest Ease	Seed Protein	Seeds/ Pound	1000 KWT	Test Weight	Seed Yield
1	Cruiser	53.0	14.7	82.7	51.3	46.0	90.1	1.3	2.3	24.8	2234	205	64.9	35.6
2	DS Admiral	52.0	14.0	82.0	60.0	57.3	95.9	1.3	1.5	23.9	1965	231	64.7	45.4
3	Eclipse	54.0	13.0	83.0	50.3	36.0	72.6	2.7	4.3	24.5	1854	245	65.2	57.2
4	Majoret	53.0	13.0	85.7	49.7	44.0	89.0	1.7	2.0	24.9	2180	208	64.9	42.2
5	Medora	54.7	13.7	84.0	54.7	45.7	84.0	2.0	3.0	23.5	2105	216	64.0	36.1
6	PS03100116	54.0	14.7	86.0	49.7	26.3	54.3	3.7	7.0	24.1	2327	195	65.4	38.6
7	PS03100278	48.7	16.3	81.3	47.0	36.7	78.7	3.3	5.0	24.3	2162	210	65.1	47.7
8	PS03100280	49.0	16.7	81.0	49.7	29.3	60.9	4.0	6.3	24.8	2104	216	64.9	43.6
9	PS03100411	51.3	15.3	81.3	43.3	20.0	46.3	4.3	7.7	24.2	1919	237	63.8	53.7
10	PS03101340	47.0	17.3	81.0	47.3	29.7	62.9	3.3	6.3	23.6	1723	264	63.9	50.0
11	PS03101349	49.0	18.3	80.7	46.3	32.7	70.6	3.3	5.3	25.4	2112	215	64.4	47.8
12	PS03101445	51.7	15.0	81.7	45.0	34.7	76.7	3.3	5.3	24.3	2379	191	64.4	51.6
13	PS03101815	50.7	14.3	80.3	49.0	18.0	37.0	4.3	8.3	26.4	1881	242	63.4	50.3
14	PS03101822	50.7	14.0	80.3	48.7	16.0	34.3	4.7	8.0	23.2	2050	222	63.5	57.0
15	PS03101867	53.0	13.3	80.7	49.3	20.0	39.7	4.3	7.0	26.8	2507	181	64.1	50.3
16	PS03690293	50.3	14.7	80.7	42.3	28.7	68.4	3.7	6.3	23.4	2307	197	63.3	43.9
17	PS04100453	53.3	13.7	81.7	48.7	40.7	83.8	2.3	3.7	24.6	2031	224	64.8	47.2
18	PS04100543	53.0	14.7	82.7	47.3	24.7	52.2	4.3	7.7	25.9	2133	213	64.3	48.4
19	PS04100722	54.0	11.0	81.7	50.0	28.7	58.1	3.3	5.7	26.6	1815	250	63.9	51.6
20	PS04100783	54.0	12.0	80.7	43.0	13.3	32.3	4.7	8.7	25.3	2551	179	63.6	47.8
	MEAN	51.8	14.5	82.0	48.6	31.4	64.4	3.3	5.6	24.7	217	2117	64.3	47.3
	C.V.%	2.2	15.5	2.2	11.8	29.9	30.1	22.9	27.1	3.2	5.2	5.4	0.6	9.4
	LSD.05	1.9	NS	3.0	NS	15.6	32.2	1.3	2.5	1.3	18.7	189	0.6	7.4
	LSD.01	2.6	NS	4.0	NS	21.0	43.4	1.7	3.4	1.8	25.1	255	0.8	9.9
	#REPS	3	3	3	3	3	3	3	3	3	3	3	3	3

Planting Date = April 26 ; Harvest Date = August 1 ; Previous Crop = Spring Wheat

Harvest Ease scores; 0 = all plants upright ~ very easy harvest, to 9 = all plants flat ~ very difficulty to harvest direct.

Harvest Index; Plant height at time of harvest relative to plant height at end of bloom.

Table 18. Preliminary Pea Yield Trial No-till, Hettinger, ND 2007.
Data from Eric Ericksmoen, North Dakota State University.

Entry	Cultivar	Days to Bloom	Duration of Bloom days	Days to Mature	Plant Height* cm	Lodg. 0-9**	1000 Seed wt. grams	Seed Yield bu/Ac
1	Cruiser	59	7	80	53	1.3	169	42.9
2	DS Admiral	58	6	78	62	0.0	162	37.2
3	Eclipse	59	9	81	51	1.0	174	38.6
4	Majoret	60	6	81	48	0.3	167	42.9
5	Medora	57	8	78	49	1.3	169	32.9
6	PS03100116	59	6	83	43	7.0	181	40.1
7	PS03100278	57	8	76	53	1.3	171	34.3
8	PS03100280	57	8	76	52	0.7	159	40.1
9	PS03100411	59	7	79	45	4.0	166	34.3
10	PS03101340	57	8	80	54	4.0	175	42.9
11	PS03101349	57	9	79	52	1.0	188	41.5
12	PS03101445	58	7	80	46	1.7	169	44.4
13	PS03101815	57	8	77	47	3.0	177	32.9
14	PS03101822	57	7	77	43	8.3	183	44.4
15	PS03101867	60	6	79	32	6.7	168	31.5
16	PS03690293	57	9	80	49	4.0	162	35.8
17	PS04100453	59	7	82	54	2.3	183	34.3
18	PS04100543	59	6	81	45	5.7	180	41.5
19	PS04100722	59	6	79	54	2.0	178	35.8
20	PS04100783	59	7	79	20	9.0	160	18.6
Trial Mean		58	7	79	48	3.2	172	37.3
C.V. %		0.9	9.9	0.9	6.9	31.1	6.3	17.3
LSD .05		1	1	1	5	1.7	NS	10.6
LSD .01		1	2	2	7	2.2	NS	14.2

* Plant height at maturity. ** Lodging: 0 = none, 9 = lying flat on ground.

Planting Date: April 25, 2007
Harvest Date: July 24, 2007
Previous Crop: hrsw

Table 19. North Central Extension Center Dry Pea Advanced Line Variety Trail, Minot, ND-2007. (0706)

Data from Mark Halvorson.

Entry No.	Entry Name	Rating Data Type		Lodge		P_Mildew		PLT_Height		CPY_Height		INDEX		Seed		sd/lb		Test		Protein		Yield	
		Rating Unit	Seeding Rate	Rate Unit	1	2	3	4	5	6	7	8	9	10									
17	PS04100453		4	def	2.3	e-i	24.9	a	16.8	a-d	68.1	bcd	182.5	efg	2492	fgh	65.2	a	30.3	cde	29.3	a	
18	PS04100543		6.5	abc	3	c-g	23.1	ab	10.8	ghi	46.9	gh	169	ijk	2696	cd	64.6	ab	30.1	cde	27.6	ab	
11	PS03101349		1.8	h	3	c-g	23.1	ab	19.2	a	83	a	172.1	g-j	2648	c-f	64.4	bc	32.1	b	27.4	ab	
12	PS03101445		5.3	bcd	1.8	f-i	22.9	abc	12.3	f-i	53.9	e-h	155.5	lm	2926	b	63.8	c-g	28.1	fgh	27.4	ab	
3	ECLIPSE		3	fgh	4.3	bcd	23.1	ab	16.5	a-d	71.9	a-d	197.7	bc	2301	ij	65.2	a	29.1	efg	27.1	ab	
14	PS03101822		5	b-e	2.5	e-h	18.2	fg	13.3	efg	72.7	a-d	178.5	f-i	2560	d-g	64.2	bc	29.1	efg	25.3	abc	
7	PS03100278		2	gh	1.5	ghi	22.9	abc	17	abc	74.5	a-d	161.8	jkl	2814	bc	64.5	b	31	bcd	24.1	bcd	
8	PS03100280		2	gh	0.8	i	22.7	a-d	18.2	abc	80.5	a	161.9	jkl	2822	bc	64.1	bcd	30.5	cde	24.1	bcd	
2	DS ADMIRAL		1.8	h	1.3	hi	23.6	ab	18	abc	76.1	abc	186.8	def	2437	ghi	64.3	bc	29.3	efg	23.7	b-e	
21	PS01102958		6	abc	6	a	18.5	fg	12.6	f-i	68	bcd	208	ab	2185	jk	64.5	b	27.5	h	23.6	b-e	
15	PS03101867		4	def	2.3	e-i	17.2	g	12.3	f-i	71.5	a-d	139.8	n	3254	a	65.2	a	35.5	a	21.9	c-f	
9	PS03100411		4	def	2.8	d-h	20.2	def	12.8	e-i	63.9	def	180.4	e-h	2518	e-h	64	b-f	29.4	ef	20.8	c-f	
6	PS03100116		7.3	a	3.8	b-e	23.6	ab	10.1	i	43	h	161.4	kl	2816	bc	64.4	bc	29.4	ef	20.3	c-f	
5	MEDORA		2	gh	4.8	ab	24.4	a	18.7	ab	76.9	ab	171.4	h-k	2678	cde	63.4	e-h	29.5	def	20.1	def	
19	PS04100722		4	def	3.5	b-e	22.9	abc	12.8	e-i	56	efg	189.5	cde	2402	ghi	64	b-e	31.4	bc	19.7	d-g	
4	MAJORET		3.5	d-h	4.5	abc	21.7	b-e	14	def	65.6	b-e	165	jkl	2753	bc	64.4	bc	29.9	cde	19.6	d-g	
1	CRUISER		3.3	e-h	3.3	b-f	21.2	b-e	16.2	bcd	76.6	ab	156.7	l	2929	b	63.2	ghi	29.7	de	18.9	efg	
16	PS03690293		3.5	d-h	2.8	d-h	19.7	efg	12.8	e-i	65.5	b-e	177.4	f-i	2564	d-g	62.7	i	27.4	h	18.2	fg	
10	PS03101340		3.8	d-g	3.3	b-f	22.9	abc	15.5	cde	68.2	bcd	216.5	a	2100	k	63.5	d-h	27.9	gh	17.6	fg	
20	PS04100783		6.8	ab	4.8	ab	19.5	efg	10.3	hi	53.5	fgh	145.7	mn	3124	a	63	hi	31.3	bc	17.2	fg	
13	PS03101815		4.8	c-f	4.3	bcd	20.5	c-f	13.1	e-h	64.3	c-f	194.1	cd	2343	hij	63.3	f-i	30.4	cde	14.9	g	
LSD (P=.05)			1.9		1.68		2.46		2.74		11.92		10.48		177		0.66		1.52		5.08		
CV			33.53		37.8		7.99		13.41		12.64		4.24		4.75		0.73		3.58		16.11		
Grand Mean			4		3.14		21.74		14.43		66.68		174.83		2636.18		64.08		29.94		22.32		
Replicate F			2.417		1.372		8.441		1.914		3.342		25.34		23.372		2.799		7.098		1.369		
Replicate Prob(F)			0.0751		0.26		0.0001		0.1369		0.025		0.0001		0.0001		0.0481		0.0004		0.2616		
Treatment F			6.197		4.881		6.163		8.579		6.537		27.824		22.164		9.416		11.071		5.069		
Treatment Prob(F)			0.0001		0.0001		0.0001		0.0001		0.0001		0.0001		0.0001		0.0001		0.0001		0.0001		

Means followed by same letter do not significantly differ (P=.05, LSD)

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 20. North Central Research Extension Center Western Regional Dry Pea Variety Trail, Minot, ND-2007.
Data from Mark Halvorson.

Entry No.	Description Part Rated Entry Name	1000Kw		10% BI		90% BI		Yield Bu/A		TSTWT	
		1		2		3		4		5	
1	DS Admiral	171.588	cd	7	a	2.5	c	33.73	de	61.23	a
2	Medora	143.575	e	7	a	4	c	18.3	f	57.45	a
3	PS0010836	189.8	b	7	a	3.5	c	40.83	a-e	62.2	a
4	PS01102958	185.674	b	7	a	3.1	c	33.3	de	62.2	a
5	PS02100107	167.963	d	6.3	bc	23.3	ab	37.83	b-e	63.68	a
6	PS03100278	182.013	bc	6	c	26.5	a	47.08	ab	63.2	a
7	PS03100280	184.788	bc	6	c	26.8	a	43.08	a-d	63.03	a
8	PS03101340	221.8	a	6	c	26	a	44.5	abc	62.35	a
9	PS03101445	163.3	d	6.5	b	16.5	b	35.68	cde	63.23	a
10	PS03101459	162.075	d	7	a	3.5	c	20.58	f	62.7	a
11	PS03101822	189.413	b	6	c	26.8	a	49.78	a	63.13	a
12	Stirling	146.438	e	6	c	26.7	a	31.74	e	63.57	a
LSD (P=.05)		13.5969		0.34		8.91		9.787		3.972	
CV		5.36		3.6		39.19		18.64		4.41	
Grand Mean		175.7		6.48		15.75		36.37		62.33	
Replicate F		0.449		0.397		0.488		2.393		1.079	
Replicate Prob(F)		0.7198		0.7559		0.6929		0.0874		0.3722	
Treatment F		20.661		17.098		13.485		8.245		1.501	
Treatment Prob(F)		0.0001		0.0001		0.0001		0.0001		0.1812	

Means followed by same letter do not significantly differ (P=.05, LSD)
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 21. Williston Research Extension Center Preliminary Field Peas Yield Trail, Williston, ND-2007 (0706)
Data from Neil Riveland, North Dakota State University.

Cultivar	Days to Bloom	Bloom Duration	Canopy		Seed Protein	1000 Kwt	Seeds / Pound	/ Test Weight	Seed Yield
			Height cms	Height inches					
GREEN COTYLEDON									
PS03101340 (G)	78.3	22.3	54.5	21.5	20.5	255	1781	64.2	56.74
PS02100107 (G)	83.3	17.8	49.5	19.5	21.2	201	2257	64	52.75
PS03101459 (G)	84	18	61.8	24.3	22	207	2191	64.5	53.47
PS03101445 (G)	84.5	17	58	22.8	20.5	194	2340	64.4	56.71
Medora (G)	88	14	65.3	25.7	21.9	198	2292	63.5	48.84
Stirling (G)	78.8	21.3	48.5	19.1	22.8	205	2212	64.3	54.37
YELLOW COTYLEDON									
PS03101822 (Y)	82.3	18	50	19.7	21	233	1947	63.9	57.98
PS0010836 (Y)	84.8	15.3	52	20.5	22.5	247	1834	62.7	56.44
PS03100278 (Y)	81.5	20	63.5	25	23.1	226	2002	65.5	56.86
PS03100280 (Y)	82	18.8	59.3	23.4	23.3	223	2031	65.5	55.53
PS01102958 (Y)	86	14.5	56.5	22.2	22.7	242	1874	65.3	52.73
DS Admiral (Y)	86	15	68.8	27.1	21.8	221	2052	65	50.1
HIGH MEAN	88	22.3	68.8	27.1	23.3	255	2340	65.5	57.98
LOW MEAN	78.3	14	48.5	19.1	20.5	194	1781	62.7	48.84
EXP MEAN	83.3	17.6	57.3	22.6	21.9	221	2068	64.4	54.38
C.V. %	0.6	3.8	9.2	9.2	2.4	1	1	0.5	3.2
LSD 5%	0.7	1	7.6	3	1.1	3	27	0.7	2.5
LSD 1%	1	1.3	10.2	4	1.6	5	39	1	3.36
# OF REPS	4	4	4	4	2	2	2	2	4
F-TRT	30.7	62	6.4	6.3	7	373	457	14.3	10.94

Location of the WREC: Latitude 48°8'; Longitude 103°44'; Elevation 2105 ft. Planted: April 25 on Fallow. Applied Fertilizer in lbs/a: ON:OP2O5k: Soil Test to two deet in lbs/a: 96N:21:300K:4 1.6 M pH-5.5 Soil type:iams-bowbells Loam. Harvested: July 25 Harvested Area: 60 ft². Grain protein percent ages reported on a 05 moisture basis. Trifluralin applied at 1lb/ai PPI for weed control.

Table 22. Williston Research Extension Center, Field Pea on Fallow, Williston, ND-2007.
Data from Neil Riveland, North Dakota State University.

Cultivar	Days to Bloom	Bloom Duration	Canopy Height		Seed Protein	1000 Kwt	Seeds Pound	/ Test Weight	Seed Yield
			cms	inches					
Green Cotyledon Type									
Cruiser	(G)53.0	17.3	63.8	25.1	21.3	187	2432	65	48.7
Majoret	(G)55.8	14.3	58	22.8	21.4	196	2312	65.7	52.19
Nitouche	(G)54.8	15.5	66	26	21.8	253	1794	63.3	47.07
Medora	(G)55.8	15.3	62.3	24.5	22.8	179	2533	64.7	36.13
Yellow Cotyledon Type									
CDC Mozart	(Y)54.5	16.3	51.8	20.4	20.9	221	2052	65.6	55.08
DS Admiral	(Y)55.0	14.5	62.8	24.7	21.1	224	2029	65.6	49.54
Eclipse	(Y)56.0	14.3	64	25.2	22	234	1939	64.8	54.5
IN 4176 PCA	(Y)48.8	21	48.8	19.2	22.2	206	2198	65.2	49.37
Miami	(Y)53.0	16.5	58.5	23.1	22	230	1975	66.7	56.81
PS01102958	(Y)55.5	14.8	50.5	19.9	22.7	250	1813	64.5	48.67
HIGH MEAN	56	21	66	26	22.8	253	2533	66.7	56.81
LOW MEAN	48.8	14.3	48.8	19.2	20.9	179	1794	63.3	36.13
EXP MEAN	54.2	16	58.6	23.1	21.8	218	2108	65.1	49.81
C.V. %	0.8	5.6	8.5	8.5	2.6	2	2	1.2	5.5
LSD 5%	0.6	1.3	7.2	2.8	NS	7	88	NS	3.98
LSD 1%	0.8	1.7	9.7	3.8	NS	11	126	NS	5.37
# OF REPS	4	4	4	4	2	2		2	4
F-TRT	13	21.1	6.4	6.3	2.5	120	86	2.6	17.86

Location of the WREC: Latitude 48 8'; Longitude 103 44'W; Elevation 2105ft.

Planted: April 25 on Fallow. Applied Fertilizer in lbs/a: 0N:0P2O5:0K:

Soil Test to two feet in lbs/a: 96N:22P:300K:42S 1.6OM pH-5.5

Soil Type: Williams-Bowbells Loam

Harvested: 39654 Harvested Area: 64ft²

Grain protein percentages reported on a 0% moisture basis.

Trifluralin applied at 1 lb/a ai PPI for weed control.

Table 23. Williston Research Extension Center, Western Field Pea Variety, Williston, SD-2007. (0706)
Data from Neil Riveland, North Dakota State University.

Cultivar	Days to Bloom	Bloom Duration	Canopy Height		Seed Protein %	1000 Kwt gms	Seeds Pound	/ Test Weight lbs/b	Seed Yield bus/a
			Height cms	Height inches					
GREEN COTYLEDON									
PS03101340 (G)	78.3	22.3	54.5	21.5	20.5	255	1781	64.2	56.74
PS02100107 (G)	83.3	17.8	49.5	19.5	21.2	201	2257	64	52.75
PS03101459 (G)	84	18	61.8	24.3	22	207	2191	64.5	53.47
PS03101445 (G)	84.5	17	58	22.8	20.5	194	2340	64.4	56.71
Medora (G)	88	14	65.3	25.7	21.9	198	2292	63.5	48.84
Stirling (G)	78.8	21.3	48.5	19.1	22.8	205	2212	64.3	54.37
YELLOW COTYLEDON									
PS03101822 (Y)	82.3	18	50	19.7	21	233	1947	63.9	57.98
PS0010836 (Y)	84.8	15.3	52	20.5	22.5	247	1834	62.7	56.44
PS03100278 (Y)	81.5	20	63.5	25	23.1	226	2002	65.5	56.86
PS03100280 (Y)	82	18.8	59.3	23.4	23.3	223	2031	65.5	55.53
PS01102958 (Y)	86	14.5	56.5	22.2	22.7	242	1874	65.3	52.73
DS Admiral (Y)	86	15	68.8	27.1	21.8	221	2052	65	50.1
HIGH MEAN	88	22.3	68.8	27.1	23.3	255	2340	65.5	57.98
LOW MEAN	78.3	14	48.5	19.1	20.5	194	1781	62.7	48.84
EXP MEAN	83.3	17.6	57.3	22.6	21.9	221	2068	64.4	54.38
C.V. %	0.6	3.8	9.2	9.2	2.4	1	1	0.5	3.2
LSD 5%	0.7	1	7.6	3	1.1	3	27	0.7	2.5
LSD 1%	1	1.3	10.2	4	1.6	5	39	1	3.36
# OF REPS	4	4	4	4	2	2	2	2	4
F-TRT	30.7	62	6.4	6.3	7	373	457	14.3	10.94

Location of the WREC:Latitude 48 8';Longitude 103 44'W;Elevation 2105 ft.

Planted: April 25 on Fallow. Applied Fertilizer in lbs/a:0N:0P2O5:0K:

Soil Test to two feet in lbs/a:96N:22P:300K:42S 1.6 OM pH-5.5

Soil Type: Williams-Bowbells Loam

Harvested: July 25 Harvested Area: 60ft²

Grain protein percentages reported on a 0% moisture basis.

Trifluralin applied at 1 lb/ai PPI for weed control.

Table 24. Willison Research Extension Center, Field Pea Variety of Recrop, Williston, ND-2007.
Data from Neil Riveland, North Dakota State University.

Cultivar	Days to Bloom	Bloom Duration	Canopy		Seed Protein	1000 Kwt	Seeds/ Pound	Test Weight	Seed Yield
			Height cms	Height inches					
Green Cotyledon	Type								
Camry	53.5	15.5	51.5	20.3	22.3	226	2011	66.1	50.5
CDC Striker	55.5	15	61	24	25	235	1934	66.7	41.93
CDC Sage	55.3	15.5	64.8	25.5	22.3	193	2348	66.8	39.45
Cooper	58.5	11.3	64	25.2	23.6	270	1681	64.9	49.17
Cruiser	53	18	63	24.8	22.9	195	2328	66.2	48.25
K2	51.3	19.5	59.3	23.3	23.2	213	2131	66.2	45.5
Majoret	55	15.3	55	21.7	24	202	2245	66.3	45.66
Medora	55.8	14.5	62.5	24.6	23.6	186	2434	66.1	36.22
Nitouche	54.5	16.3	56	22.1	23.9	260	1754	65.9	43.3
SWC 6232	54	15.5	54.3	21.4	22.6	198	2295	66.4	49.63
Scuba	52.8	17.3	62.8	24.7	23.1	213	2128	65.5	41.08
Tamora	58.3	12	61.8	24.3	22.7	284	1599	65.2	43.97
Yellow Cotyledon	Type								
CDC Golden	54.5	15	62.5	24.6	25.7	211	2147	67.3	46.74
CDC Meadow	53.8	16	62.5	24.6	23.7	202	2251	67	46.72
CDC Mozart	52.8	18	57.3	22.5	22.9	216	2101	65.4	48.9
Ceb 4163	55.3	14.5	57	22.5	23.3	235	1931	66.9	49.17
DS Admiral	54.3	15.3	55.8	22	23.1	231	1968	65.2	45.94
Eclipse	55	14.8	61.5	24.2	23.2	232	1953	65.4	49.96
IN 4176 PCA	49.8	20.3	62.5	24.6	23.9	255	1782	66.6	46.52
IN4179	51.8	18.5	65	25.6	23.9	214	2125	66.5	40.67
Miami	53	16.3	52.5	20.7	24.1	230	1971	65.8	46.75
Noble	55.5	14.3	65.3	25.7	24.5	220	2063	65.5	42.39
Polstead	53	16	55.3	21.7	23.4	250	1812	66	50.42
Pro 053-7072	50.8	18.8	65.3	25.7	24	247	1839	67.2	42.4
PS01102958	55	15.5	51.8	20.4	24.5	251	1809	66.9	43.46
SW Capri	54.3	15.3	55.3	21.8	22.9	203	2235	66.2	45.41
SW Salute	53.5	17.3	61.3	24.1	23.2	223	2036	66.4	49.95
SW Marquee	55	15.8	56.8	22.4	24	206	2204	67	45.67
SW Midas	54.5	14.8	54.5	21.5	22.2	195	2326	66.6	46.12
Tudor	57.3	12.5	68	26.8	23.2	270	1683	66.2	42.58
HIGH MEAN	58.5	20.3	68	26.8	25.7	284	2434	67.3	50.5
LOW MEAN	49.8	11.3	51.5	20.3	22.2	186	1599	64.9	36.22
EXP MEAN	54.2	15.8	59.5	23.4	23.5	226	2038	66.2	45.48
C.V. %	1.3	6.6	10.4	10.4	2.1	3	3	0.8	7.24
LSD 5%	1	1.5	8.7	3.4	1	14	120	1.1	4.63
LSD 1%	1.3	1.9	11.5	4.5	1.4	19	162	1.5	6.13
# OF REPS	4	4	4	4	2	2	2	2	4
F-TRT	31.4	15.4	2.2	2.2	5.3	28	29	2.6	4.78

Relative efficiency Lattice analysis vs RCBD for yield = 136%

Location of the WREC: Latitude 48.8'. Longitude 10344'W; Elevation 2105 ft.

Planted: April 25 into tilled durum stubble.

Applied Fertilizer in lbs/a: 70N:P206:OK:

Soil Test to two feet in lbs/a: 33N:34P:320K:1.8% OM pH-.7

Soil type: Williams-Bowbels Loam

Harvested: July 20 Harvested Area: 64 ft²

Grain protein percentages reported on a 0% moisture basis.

Pursuit Plus at 20oz s/a with additional Prowl H2O PPI and Assure II postemergence gave good weed control

Table 25. Western Regional Field Pea Variety Trial, Wall, SD-2007. (0706)
 Data from John Rickertsen, South Dakota State University.

Variety	Height	Lodging	Seed Size	Test Wt	Yield
	Inches	0-9*	Seeds/Lb	Lb/Bu	Lb/A
PS0010836	17	0.0	2200	60.2	32.0
PS01102958	15	0.0	2500	60.3	24.6
PS02100107	16	1.0	2650	59.0	29.8
PS03100278	17	0.0	2500	60.7	35.4
PS03100280	15	0.0	2450	60.5	37.4
PS03101340	17	1.0	2120	59.2	34.9
PS03101445	17	1.5	2830	59.3	29.3
PS03101459	18	0.5	2550	58.0	29.5
PS03101822	17	1.0	2350	61.5	37.5
Stirling	16	1.0	2820	60.0	31.1
Medora	21	1.0	2770	59.5	21.9
DS Admiral	17	1.0	2430	59.7	29.0
CDC Mozart	19	0.0	2690	61.2	26.0
Grande	20	1.0	2850	59.3	24.0
Average	17.0	0.6	2551	59.9	30.2
LSD (P=.05)	3.8	2.3	.	2.1	3.0
CV	10.2	163.9	.	2.4	7.0

* 0=No lodging, 9 = 100% lodged.

Table 26. Western Regional Winter Field Pea Variety Trial – Wall, SD-2003-2007.
Data from John Rickertsen, South Dakota State University.

Variety	Seeds/Lb	Test Wt Lb/Bu	Yield 2007	Bu/A 3 Year**
Specter	3830	62.0	18.6	20.1
Windham	3250	64.2	25.2	26.1
PS9830F011	3510	63.5	28.5	25.8
PS0230F092	3880	63.6	16.9	--
PS0230F063	3940	63.8	24.5	--
PS0230F092	4350	62.8	24.1	--
PS03100635	4730	63.3	16.5	--
PS03101146	4260	62.9	24.5	--
PS03101150	4140	62.3	20.1	--
PS03101160	4080	61.6	21.8	--
Mean	3997	63.0	22.1	24.0
LSD (P=.05)	--	--	3.5	3.8
CV	--	--	10.8	18.7

** 2003, 2005, 2007.

Winter Feed Pea Trials

Seven winter feed pea entries were included in the 2007 Winter Feed Pea Western Regional Yield Trial and evaluated at 4 locations across three states. All seven entries represent the most advanced breeding lines from the USDA-ARS breeding program and included yellow and green cotyledon types. 'Specter' and 'Windham' are two white-flowered winter feed pea types released from the program. Information regarding experimental design, location and specific observations for some of the locations are included below. Among the locations returning results for all seven lines the highest yielding line was PS03101160 (928 lb/a) followed by PS03100635 (922 lb/a). Windham and Specter produced average yields of 1167 and 953 lb/a, respectively. Overall, yields were significantly lower in 2007 compared to previous years.

Table 27. Summary of Locations Participating in the 2007 Winter Feed Pea Western Regional Yield Trial.

Location	Contact	Conditions	Nurseries		
			Seed Sent	Data Returned	Data Lost
Montana					
Moccasin	Chengci Chen, Karnes Neill	Dryland	✓		✓
North Dakota					
Hettinger	Eric Eriksmoen	Dryland	✓		✓
South Dakota					
Wall	John Rickertsen	Dryland	✓	✓	
Washington					
Waterville	Howard Nelson	Dryland	✓	✓	
Wilbur	Howard Nelson	Dryland	✓	✓	
Grand Totals			5	3	2

Table 28. Location Yield Summary (lb/a) for Western Regional Winter Feed Peas-2007.

Location	WINDHAM	SPECTER	PS0230F063	PS0230F092	PS03100635	PS03101146	PS03101160
Wall, SD	25.2	18.6	24.5	24.1	16.5	24.5	21.8
Moccasin MT	2309	1888	1766	1756	1827	1809	1834
Waterville, WA	3526	2655		2448	1493		2157
Wilbur, WA	3900	3485		3381	3361	3319	3277
Mean	1167	953	895	890	922	917	928

Table 29. Post Harvest Quality Evaluations of Winter Feed Pea Lines in the Western Regional Pea Trials-2007.

Name	100 Seed Weight	Hard Seed	Water Uptake	Cooking Time	Conductivity	Post Soak Seed Color	Post Soak Bleach	Post Cook Seed Color	Post Cook Broth Color	Seed Coat Separates	Cooked to Mush
WINDHAM	14.1	3	102	21	48.3	G	0.0	G	5	N	N
SPECTER	11.4	1	107	23	74.3	G	0.0	G	5	N	N
PS0230F063	12.6	1	105	19	52.7	G	6.0	G	5	N	N
PS0230F092	13.6	0	112	20	48.7	G	8.3	G	5	N	N
PS03100635	11.9	1	100	20	37.0	G	0.0	G	6	Y	N
PS03101146	14.7	0	106	18	68.0	G	4.3	G	5	N	N
PS03101160	14.2	0	113	19	38.0	G	3.7	G	5	N	N
Check Mean	12.8	2	104	22	61.3	G	0.0	G	5	N	N
Grand Mean	15.7	1	106	20	52.4	G	3.2	G	5	N	N
CV	13.2	127	2	4	3.5	-	35	-	132	-	-
LSD	3.4	2	5	2	3.3	-	2.0	-	0	-	-

Seed used for post harvest quality evaluations was grown at Pullman, WA in 2007.

Conductivity is expressed as microsiemens per gram of seed.

Post Seed Soaking Color Evaluation: G = Good; F = Fair; P = Poor.

Cooking time determined by removing a small sub-sample at two minute intervals and mashed with a fork until deemed cooked.

Post Cooking Seed Color is rated as: G = Good; F = Fair; P = Poor.

Post Cooking Broth Color is rated as: 4 = dark; 5 = Light; 6 = Muddy.

Seed Coat Separates From Cotyledon (Sloughs) During Cooking: Y = Yes; N = No.

Seed Cooks To Mush (Looses Rigidity And Individual Seed Identity): Y = Yes; N = No.

Cooking tests conducted on each of three seed lots soaked for 20 hours.

All data in the above table is the average of three 100 seed sub-samples.

Table 30. Winter Pea CPT- Wall, SD-2007.
Data from John Rickertsen, South Dakota State University.

Variety/Selection		Test Wt Lb/BU	Yield Bu/Ac
Trt No.	Treatment Name	5	6
1	Specter		18.6
2	Windham	60.43	25.2
3	PS9830F011	60.58	28.5
4	PS0230F092		16.9
5	PS0230F063	60.27	24.5
6	PS0230F092	58.7	24.1
7	PS03100635		16.5
8	PS03101146	57.95	24.5
9	PS03101150	55.9	20.1
10	PS03101160	56.33	21.8
LSD (P=.05)		2.699	3.46
Standard Deviation		1.688	2.38
CV		2.88	10.79
Grand Mean		58.59	22.08
Bartlett's X2		5.842	6.316
P(Bartlett's X2)		0.322	0.708
Replicate F		0.452	25.887
Replicate Prob(F)		0.7219	0.0001
Treatment F		5.36	11
Treatment Prob(F)		0.0129	0.0001

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Column 2: TY1 = 7.593793*[3]

Table 31 Western Regional Winter Pea Selection - Agronomy Summary. Moccasin, MT-2007.
Data from Chengji Chen and Karnes Neill, Central Ag Research Center

Selection ^b	Survival		Biomass		Grain Harvest		Grain Weights	
	Rating (1-5)	Height (cm)	Yeild (lbs/acre)	Height (cm)	Yield (lbs/acre)	Moisture (%)	Test (lbs/bu)	Kernel (g/1,000)
Specter	4.5 ^a	83.3 ^a	3206	92.5 ^a	1888	10.7 ^a	64.3 ^a	130.5 ^a
Windham	4.6 ^a	55.3 ^a	3512 ^a	68.3 ^a	2309 ^a	11.3 ^a	64.6 ^a	145.5 ^a
PS9830F011	4.4 ^a	55.0 ^a	3433 ^a	59.8 ^a	2165 ^a	11.2 ^a	64.4 ^a	142.3 ^a
PS0230F092b	4.1 ^a	48.0 ^a	2967	58.0 ^a	1896	10.5 ^a	64.5 ^a	135.8 ^a
PS0230F063	3.3 ^a	47.0 ^a	2444	59.0 ^a	1766	10.4 ^a	65.3 ^a	134.1 ^a
PS0230F092a	3.4 ^a	57.8 ^a	2102	65.3 ^a	1756	10.8 ^a	66.1 ^a	151.1 ^a
PS03100635	3.9 ^a	73.5 ^a	3175	79.0 ^a	1827	11.2 ^a	63.9 ^a	114.6 ^a
PS03101146	4.0 ^a	56.3 ^a	2541	63.3 ^a	1809	10.3 ^a	64.5 ^a	144.8 ^a
PS03101150	3.4 ^a	51.8 ^a	2295	69.5 ^a	1930	10.2 ^a	64.7 ^a	146.6 ^a
PS03101160	4.6 ^a	50.5 ^a	2732	61.3 ^a	1834	10.4 ^a	63.6 ^a	150.1 ^a
PS9430706	3.8 ^a	82.0 ^a	2438	118.8 ^a	1707	10.5 ^a	64.6 ^a	133.8 ^a
PS7530726	3.9 ^a	49.8 ^a	2794	59.0 ^a	1814	10.1 ^a	63.6 ^a	140.1 ^a
PS9630448	4.6 ^a	86.5 ^a	3177	96.3 ^a	1695	10.4 ^a	64.0 ^a	129.7 ^a
PS9830F010	3.9 ^a	83.3 ^a	2653	75.0 ^a	1623	10.4 ^a	64.0 ^a	132.4 ^a
PS9830S431	4.0 ^a	74.0 ^a	2643	75.3 ^a	1752	11.3 ^a	63.8 ^a	120.1 ^a
PS03100660	3.4 ^a	68.3 ^a	2311	71.3 ^a	1863	11.1 ^a	63.7 ^a	112.5 ^a
Granger	4.9 ^a	94.5 ^a	3354	91.5 ^a	1838	11.6 ^a	65.2 ^a	137.3 ^a
Mean (n = 80)	4.0	65.7	2810	74.3	1851	10.7	64.4	135.4
LSD _{0.05} (by t)	0.7	9.7	749	21.0	212	0.4	0.5	5.5
CV% (s/means)	14.3	10.9	18.64	20.2	8.2	3.5	0.60	2.7
F-Value (df = 19,57)	3.8	21.52	2.75	5.14	5.01	8.64	12.00	35.89

^a - Denotes values equal to the highest value (in **bold**), based on LSD_{0.05}.

^b - CARC received two (2) seed bags labeled "PS2030F092", but did not receive Line "PS0230F061" Consequently, we seeded both PS2030F092 and distinguished them by "a" and "b"

Table 32 Winter Pea Comparative Yield, Waterville,WA-2007.
Data from Howard Nelson, Central Washington Grain Growers

Variety	Class	3-Year Ave	2-Year Ave	2007 Yield	2006 Yield	2005 Yield
Windham	Yellow	2,938 (1)	2,859 (1)	3,526 (1)	2,191 (6)	3,097 (1)
PS9830F011	Yellow	2,699 (2)	2,548 (2)	3,194 (2)	1,901 (13)	3,001 (2)
PS03101146	Green		2,454 (3)	2,531 (6)	2,376 (4)	
PS0230F092	Green		2,425 (4)	2,448 (7)	2,402 (3)	
Specter	Yellow	2,327 (4)	2,305 (5)	2,655 (5)	1,954 (12)	2,372 (4)
PS03101160	Yellow		2,280 (6)	2,157 (11)	2,402 (2)	
PS0230F061	Green		2,240 (7)	2,240 (9)	2,240 (9)	
PS03101150	Green		2,240 (8)	2,240 (10)	2,240 (10)	
Whistler	Yellow	2,431 (3)	2,171 (9)	2,282 (8)	2,059 (8)	2,953 (3)
PS03100635	Yellow		1,748 (10)	1,493 (13)	2,003 (11)	
PS0230F063	Yellow			3,029 (3)		
WPX 90104-8	Yellow			2,697 (4)		
WPX 90104-3	Yellow			1,950 (12)		

Table 33 Winter Pea Comparative Yield, Wilbur WA-2007.
Data from Howard Nelson, Central Washington Grain Growers

Variety	Class	3-Year Ave	2-Year Ave	2007 Yield	2006 Yield	2005 Yield
PS9830F011	Yellow	3,128 (1)	2,878 (1)	3,775 (2)	1,980 (1)	3,630 (1)
Windham	Yellow	2,949 (2)	2,729 (2)	3,900 (1)	1,558 (6)	3,388 (3)
PS03100635	Yellow		2,552 (3)	3,361 (8)	1,742 (4)	
PS03101150	Green		2,521 (4)	3,194 (11)	1,848 (2)	
PS03101160	Yellow		2,470 (5)	3,277 (10)	1,663 (5)	
Specter	Yellow	2,566 (4)	2,416 (6)	3,485 (5)	1,346 (8)	2,868 (4)
PS0230F092	Green		2,364 (7)	3,381 (7)	1,346 (9)	
PS0230F061	Green		2,295 (8)	3,402 (6)	1,188 (10)	
PS03101146	Green		2,241 (9)	3,319 (9)	1,162 (11)	
Whistler	Yellow	2,578 (3)	2,088 (10)	2,406 (13)	1,769 (3)	3,558 (2)
WPX-90104-8	Yellow			3,692 (3)		
PS0230F063	Yellow			3,568 (4)		
WPX-90104-3	Yellow			3,194 (12)		

Lentil Trials

Twenty spring lentil entries in the Western Regional Yield Trial were evaluated at 5 locations across three states (Table 35). The entries comprised seven checks, 'Pennell', 'Merrit', 'Riveland', 'Richlea', 'Eston', 'Pardina', 'Crimson' and 13 breeding lines including two Richlea, two Laird, three Eston, three Pardina and three Turkish Red types. Information regarding experimental design, location and specific observations for some of the locations are included below. Average yields are reported only for lines in common for the Nez Perce and Moscow, ID; Moccasin, MT and Carrington, ND. The highest yielding line was LC01602300R (1186 lb/a) and the checks produced average yields of 1083, 1116, 1080, and 960 lb/a for Merrit, Richlea, Eston, and Crimson, respectively. Riveland the most recent release produced an average yield of 1006 across the four locations.

Table 34. Summary of Locations Participating in the 2007 Spring Lentil Western Regional Yield Trial.

Location	Contact	Conditions	Seed Sent	Nurseries	
				Data Returned	Data Lost
Idaho					
Moscow	Stephen Guy	Dryland	✓	✓	
Nezperce	Stephen Guy	Dryland	✓	✓	
Genesee	Stephen Guy	Dryland	✓	✓	
Montana					
Moccasin	Chengci Chen, Karnes Neill	Dryland	✓	✓	
North Dakota					
Carrington	Blaine Schatz, Steve Zwinger	Dryland	✓	✓	
Hettinger	Eric Eriksmoen	Dryland	✓		✓
Minot	Mark Halvorson	Dryland	✓		✓
Williston	Neil Riveland	Dryland	✓	✓	
South Dakota					
Rapid City	Johns Rickertsen		✓		✓
Grand Totals			9	6	3

Table 35. Location Yield Summary (lb/a) for Western Regional Lentil Trails-2007.

Name	Nezperce ID	Moscow, ID	Moccasin, MT	Carrington, ND	Williston, ND	Mean
ESTON	770	1785	986.8	778		1080
LC01602273E	785	1885	1019	814		1126
LC01602307E	605	1980	989.2	957		1133
LC03601590E	810	1760	944.4	1135		1162
PARDINA				513	1224	
LC02601144P	785	1835	918.4	666		1051
LC04600346P				471		
LC04600350P	775	1810		449		
CRIMSON	740	1710	953.7	435	1154	960
LC03600482T	850	1580	857.9	595		971
LC01602062T	715	2170	956.3	682	1353	1131
LC04600751T	835	1670		508		
MERRIT	685	1780	1128	737		1083
PENNELL			795.4	803	946	
RIVELAND	665	1760	918.6	679	989	1006
RICHLEA	745	1900	981.8	836	1268	1116
LC01602300R	920	2010	1017	798		1186
LC02600793L			861.8	458		
LC03601115L				850		
LC03601588R				751		

Table 36. Post Harvet Quality Evaluations of Lentil Lines in the Western Regional Lentil Trials-2007.

Name	100 Seed Weight	Hard Seed	Water Uptake	Cooking Time	Conductivity	Post Soak Seed Color	Post Cook Seed Color	Post Cook Broth Color	Seed Coat Separates	Cooked to Mush
<i>Eston Types</i>										
ESTON	3.5	9.7	85.55	27	35.6	G	1	6	Y	N
LC01602273E	3.6	5.7	102.18	29	31.7	G	2	6	Y	N
LC01602307E	4.3	3.7	103.57	27	33.3	G	2	6	Y	N
LC03601590E	3.7	2.3	111.34	29	33.1	G	2	6	Y	N
CV	5.5	51.6	10.6	3.1	8.2		1413.9			
GRAND MEAN	4.0	5.3	100.7	28.0	33.4		1.8			
LSD	0.4	5.5	21.2	1.8	5.5		0.0			
<i>Pardina Types</i>										
PARDINA	3.7	13	74.8	28	40.7	G	2	6	Y	N
LC02601144P	3.7	3.7	95.2	29	28.4	G	1	4	N	N
LC04600346P	4.4	16	61.8	29	37.5	G	1	5	N	N
LC04600350P	4.1	7.3	87.5	29	40	G	2	6	N	N
CV	4.5	24.0	8.9	2.0	11.7		2222.2	300.8		
GRAND MEAN	4.2	10.0	79.8	29.0	36.6		1.5	5.3		
LSD	0.3	4.8	14.2	1.2	8.6		0.0	0.0		
<i>Turkish Red Types</i>										
CRIMSON	3.5	2.7	102.7	27	27.8	G	2	6	Y	N
LC03600482T	3.3	28.0	14.8	29	26.2	G	1	4	N	N
LC01602062T	4.6	11.0	82.8	29	48.8	G	1	6	Y	N
LC04600751T	3.8	4.7	106.0	28	50.5	G	2	6	Y	N
CV	2.7	45.5	22.1	3.6	54.3		2222.2	286.3		
GRAND MEAN	4.5	11.7	76.6	28.0	38.3		1.5	5.5		
LSD	0.2	10.6	33.7	2.0	41.6		0.0	0.0		
<i>Large Green Lentils</i>										
MERRIT	6.3	5.3	110.4	29	43.9	G		6	Y	N
PENNELL	7.2	11.0	95.7	28	47.0	G		6	N	N
RIVELAND	7.5	2.0	114.8	29	57.0	G		6	N	N
RICHLEA	5.2	2.7	110.8	28	55.5	G		4	Y	N
LC01602300R	5.1	1.0	109.2	29	50.9	G		6	Y	N
LC02600793L	7.6	7.0	102.7	29	65.1	G		6	Y	N
LC03601115L	7.2	1.7	114.6	27	41.7	G		6	Y	N
LC03601588R	4.8	0.3	121.2	27	50.2	G		6	Y	N
CV	3.0	23.8	6.3	3.4	9.3			200.1		
GRAND MEAN	6.9	3.9	109.9	28.3	51.4			5.8		
LSD	0.3	1.6	12.1	1.7	8.4			0.0		

Seed used for post harvest quality evaluations was grown at Pullman, WA in 2006.

Conductivity is expressed as microsiemens per gram of seed.

Post Seed Soaking Color Evaluation: G = Good; F = Fair; P = Poor.

Cooking time determined by removing a small sub-sample at two minute intervals and mashed with a fork until deemed cooked.

Post Cooking Seed Color is rated as: 1 = Good; 2 = Fair; 3 = poor.

Post Cooking Broth Color is rated as: 4 = dark; 5 = Light; 6 = Muddy.

Seed Coat Separates From Cotyledon (Sloughs) During Cooking: Y = Yes; N = No.

Seed Cooks To Mush (Looses Rigidity And Individual Seed Identity): Y = Yes; N = No.

Cooking tests conducted on each of three seed lots soaked for 18 hours.

All data in the above table is the average of three 100 seed sub-samples.

Table 37. Seed yield averages for lentil varieties tested for three years in northern Idaho
 Data from Stephen Guy, University of Idaho.

Variety or Selection	2005	2006	2007	Average
	-----lb/acre-----			
Brewer	1490	1230	1140	1287
Crimson	1350	1210	1225	1262
Eston	1390	1170	1280	1280
Merrit	1450	1300	1235	1328
Pardina	1530	1230	1330	1363
Richlea	1320	1310	1325	1318
Riveland	1280	1400	1215	1298
LC1602307E	1370	1380	1295	1348
LC1602062T	1510	1280	1445	1412
Average	1410	1280	1280	1323
LSD (0.10)	90	119	70	-

Table 38. No-till Lentil Variety Performance Results, Genesee and Moscow, ID-2007.
 Data from Stephen Guy, University of Idaho.

Variety or Selection	Seed Yield			Seed Weight			Plant Height		
	Genesee	Moscow	Average	Genesee	Moscow	Average	Genesee	Moscow	Average
	-----lb/acre-----			-----g/100-----			-----inches-----		
Brewer	1220	1335	1280	5.5	5.5	5.5	12	13	13
Eston	1115	1305	1210	3.2	3.2	3.2	13	13	13
Merrit	1190	1465	1330	6.1	5.9	6.0	14	13	14
Pardina	1270	1300	1285	3.9	3.4	3.7	11	11	11
Richlea	1415	1405	1410	4.8	5.1	5.0	14	13	14
Riveland	1245	1500	1375	6.8	7.2	7.0	15	15	15
Average	1240	1385	1315	5.1	5.1	5.1	13	13	13
LSD (0.10)	145	ns	--	0.2	0.2	0.2	1	1	1
CV (%)	9	10	--	3	3	--	9	7	--

Table 39. Seed Yield and Seed Weight for No-till Lentil Varieties Tested for Three Years in Northern Idaho-2007.
 Data from Stephen Guy, University of Idaho.

Variety or Selection	Seed Yield				Seed Weight			
	2005	2006	2007	Average	2005	2006	2007	Average
	-----lb/acre-----				-----g/100-----			
Brewer	1170	680	1280	1045	5.4	5.0	5.5	5.3
Eston	1040	790	1210	1015	3.1	3.0	3.2	3.1
Merrit	1220	790	1330	1115	5.9	5.5	6.0	5.8
Pardina	1440	920	1285	1215	3.8	3.3	3.7	3.6
Richlea	1280	850	1410	1170	4.6	4.7	5.0	4.8
Average	1260	730	1315	1100	4.8	4.6	5.1	4.8
LSD (0.10)	220	117	ns	--	0.1	0.2	0.2	--

Table 40. Western Regional Spring Lentil Selection Evaluation- Agronomic Summary, Moccasin, MT-2007.

Data from Chengci Chen and Karnes Neill, Central Ag Research Center.

Selection	Canopy Height cm	Yield	Moisture	Grain Weights	
				Test	Kernel
Pennell	27.3	795.4	9.7	58.7	Not
Riveland	35.5 ^a	918.6	9.6	58.5	Complete
LC99602075L	31.5 ^a	828.4	9.5	58.4	
LC02600793L	32.0 ^a	861.8	10.1	59.3	
Merrit	33.0 ^a	1128.0 ^a	9.4	59.0	
Brewer	31.8 ^a	953.2	9.5	60.1	
Eston	28.3	986.8 ^a	9.5	64.1	
LC01602273E	30.5	1019.0 ^a	9.9	63.7	
LC01602307E	29.0	989.2 ^a	10.4 ^a	62.8	
LC03601590E	27.0	944.4	9.8	62.8	
Pardina	24.5	1018.0 ^a	10.1	65.0	
LC01602245P	26.5	1069.0 ^a	10.1	65.4	
LC02601144P	28.0	918.4	10.1	65.5	
Vantage	30.8	1016.0 ^a	9.6	62.4	
Richlea	30.8	981.8 ^a	10.0	60.2	
LC01602300R	30.3	1017.0 ^a	9.9	61.2	
Crimson	25.8	953.7	9.6	64.0	
LC01602062T	27.3	956.3	9.6	64.2	
LC02601276T	28.8	889.2	9.4	66.5 ^a	
LC03600482T	28.3	857.9	9.2	66.5 ^a	
Means (<i>n</i> = 80)	29.3	955.1	9.7	62.4	
LSD _{0.05} (by t)	4.6	161.6	0.4	0.4	
CV% (s/means)	11.06	11.95	2.584	0.455	
F-Value (19, 57 df)	2.77	2.07	6.45	387.17	

^a - Indicates values equal to highest value (in **bold**) based on LSD_{0.05}.

Table 41. NDSU Carrington Research Extension Center Lentil Variety Trial, Carrington, SD-2007.
Data from Blaine Schatz and Steve Zwinger, North Dakota State University

Obs	Variety	Seed Coat Color	Market Type	Days to Bloom	1000 KWT	Seeds / Pound	Test Weight	Seed Yield
					gms		lbs/bu	lb/acre
1	CDC 2471-C1	Green	Medium	46.3	41.2	11045	56.7	654
2	CDC Blaze	Red	Small	46.0	28.3	16086	58.7	535
3	CDC Impact	Red	Small	45.8	28.5	15942	57.9	742
4	CDC Imperial	Red	Extra Small	45.0	23.2	19635	56.5	598
5	CDC Improve	Green	Large	46.8	66.2	7157	57.1	681
6	CDC Milestone	Green	Small	45.8	32.1	14134	56.3	490
7	CDC Plato	Green	Large	47.8	49.3	9216	55.0	281
8	CDC Redberry	Red	Small	46.3	27.7	16410	58.2	1027
9	CDC Robin	Red	Small	45.5	24.2	18773	57.7	645
10	CDC Rouleau	Red	Small	46.8	30.7	14774	55.7	677
11	CDC Viceroy	Green	Small	47.8	26.8	17004	58.9	1056
12	Crimson	Red	Small	46.8	30.5	14890	58.0	279
13	Pennell	Green	Large	46.8	56.6	8022	53.6	549
14	CDC Richlea	Green	Medium	47.0	41.6	10927	56.1	494
15	Riveland	Green	Large	45.3	55.9	8174	54.3	648
		MEAN		46.4	37.0	13587	56.7	677
		C.V.%		1.6	11.3	4.3	1.7	27.2
		LSD.05		1.0	6.0	828	1.3	263
		LSD.01		1.4	8.0	1107	1.8	351
		#REPS		4	4	4	4	4

Planting Date = May 9 ; Harvest Date = August 17 ; Previous Crop = Spring Wheat

** The trial was significantly infected with anthracnose by mid July;

** Unlike some previous years the anthracnose infection overtook all varieties within the trial.

** CDC Imperial, CDC Impact, CDC Improve, and CDC experimental lines are all Clearfield types.

Table 42. Lentil Variety on Fallow, Williston, ND-2007.
Data from Neil Riveland, Williston Research Extension Center

Cultivar	Days to Bloom	Bloom Duration	--- Canopy ---		Test Weight	1000 Kwt	Seeds/ Pound	Seed Yield	Seed Yield	
			Height	Height							lbs/b	gms	lbs/a	bus/a
			cms	inches						
LARGE GREEN										
CDC Glamis	26	21.3	30.3	11.9	58.6	52.5	8536	806	13.43	(Green)
CDC Grandora	22.5	24.3	30.0	11.8	58.7	57.6	7476	802	13.37	(Green)
CDC Meteor	23	21.8	30.0	11.8	60.9	42.6	10102	1033	17.22	(Green)
CDC Plato	24.3	21.8	29.0	11.4	58.9	56.9	8035	881	14.68	(Green)
CDC Sedley	22.3	22.8	27.3	10.7	59.4	64	7055	706	11.77	(Green)
CDC Sovereign	24.8	20.3	30.3	11.9	59.9	56.6	7933	990	16.5	(Green)
Laird	25.5	22	29.5	11.6	58.6	57.9	8147	794	13.23	(Green)
LC860359L	22	20.8	27.8	10.9	60	61.5	7348	1143	19.04	(Laird)
LC99600747L	20	22.8	35.3	13.9	59.9	61.7	7214	1168	19.46	(Laird)
Pennell	22	22.8	27.3	10.7	58.1	61.7	7200	946	15.76	(Green)
Riveland	19.8	24.3	28.8	11.3	58.5	66.5	6372	989	16.48	(Green)
MEDIUM GREEN										
CDC Richlea	23.3	20.3	28.8	11.3	60.1	45.4	9627	1268	21.13	(Green)
SMALL GREEN										
CDC Milestone	21.5	19.8	25.8	10.1	62.5	32.1	13494	1159	19.32	(Green)
CDC Viceroy	24.5	19.3	26.8	10.5	63	28.2	16939	1164	19.39	(Green)
LC01602307E	22.8	20.8	28.0	11.0	61.5	40.9	10700	1390	23.16	(Eston)
SMALL RED										
CDC Blaze	23.3	19	23.5	9.3	64.2	32.6	14616	1009	16.81	(Red)
Crimson	24.8	18.5	22.5	8.9	62.9	31.6	14488	1154	19.22	(Red)
CDC Robin	21	21	23.8	9.4	64.1	24.8	17878	1113	18.55	(Red)
CDC Redberry	22.5	19.8	30.0	11.8	63.3	27.8	16438	1233	20.55	(Red)
CDC Rouleau	21.8	21.3	26.0	10.2	62.2	34.3	13182	1183	19.7	(Red)
LC1602062T	19.3	21	23.8	9.4	63.2	43.5	10527	1353	22.54	(Turkish Red)
BROWN										
Pardina	18.8	21	22.0	8.7	63.9	36	12542	1224	20.4	(Brown)
FRENCH										
CDC LeMay	24.5	18.5	25.3	9.9	63.4	28	16021	1103	18.38	(French Green)
ZERO TANNIN										
LC7601114YZ	18.3	26.3	27.0	10.6	62.3	52.8	7957	1079	17.97	(Yellow-Zero Tan)
LC00600917RZ	19.8	22.5	25.8	10.1	63.3	42	10136	1103	18.38	(Red-Zero Tannin)
HIGH MEAN	26	26.3	35.3	13.9	64.2	66.5	17878	1390	23.16	
LOW MEAN	18.3	18.5	22.0	8.7	58.1	24.8	6372	706	11.77	
EXP MEAN	22.3	21.3	27.4	10.8	61.2	45.6	10799	1072	17.86	
C.V. %	3	5.4	8.0	7.9	0.4	2.4	3	8.7	8.65	
LSD 5%	1	1.6	3.1	1.2	0.5	2.3	625	132	2.18	
LSD 1%	1.3	2.1	4.1	1.6	0.6	3.1	847	175	3.05	
# OF REPS	4	4	4	4	2	2	2	4	4	
F-TRT	40.9	10.6	7.6	7.6	170.1	3	3.7	283	14.1	12.12

Relative efficiency Lattice vs RCBD analysis for yield = 10.11
 Location of the WREC: Latitude 48 8'; Longitude 103 44'W; Elevation 2105 ft.
 Planted: May 1 on Fallow. Applied Fertilizer in lbs/a: 0N:0P2O5:0K:
 Soil Test to two feet in lbs/a: 96N:22P:300K:42S1.6 OM pH-5.5
 Soil Type: Williams-Bowbells Loam
 Harvested: July 25 and 39 660 Harvested Area: 60 ft²
 Trifluralin fall applied at 1 lb/a ai PPI for weed control

Winter Lentil Trials

Eight winter lentil entries in the Western Regional Yield Trial were evaluated at 4 locations across three states. The entries comprised two checks, 'Morton', WA8649041, and eight breeding lines. Data were collected from two locations (Table 50). Information regarding experimental design, location and specific observations for some of the locations are included below. Morton produced an average yield of 893 lb/a, while two breeding lines produced average yields of 1030 lb/a (LC9978057T) and 677 lb/a (LC03600232T).

Table 43. Summary of Locations Participating in the 2006 Winter Lentil Western Regional Yield Trial.

Location	Contact	Conditions	Nurseries		
			Seed Sent	Data Returned	Data Lost
<i>Montana</i>					
Moccasin	Chengci Chen, Karnes Neill	Dryland	✓	✓	
<i>South Dakota</i>					
Hayes	John Rickertsen	Dryland	✓	✓	
Grand Totals			2	2	0

Table 44. Location Yield Trial Summary For Western Regional Winter Lentil-2007.

Location	LC9440070r	LC9978057T	MORTON_	WA8649041	LC03600232T	LC03600190T	LC03600245T	LC02601276T
Moccasin, MT	1094	1525	1273	1113	962	580	1067	944
Wall, SD	240	534	512	272	392	131	185	76
Mean	667	1030	893	693	677	356	626	510

Table 45. Post Harvest Quality Evaluations of Winter Lentil Lines in the Western Regional Lentil Trials-2007.

Name	100 Seed Weight	Hard Seed	Water Uptake	Cooking Time	Conductivity	Post Soak Seed Color	Post Cook Seed Color	Post Cook Broth Color	Seed Coat Separates	Cooked to Mush
LC9440070r	5.2	3	112.08	27	50.5	G	1	4	N	N
LC9978057T	3.2	13	83.06	28	39.5	G	2	4	Y	N
MORTON_	3.1	13	74.71	24	68.2	G	2	4	N	N
WA8649041	3	15	74.44	23	49.9	G	2	4	Y	N
LC03600232T	3.4	9	85.42	27	39.2	G	2	6	Y	N
LC03600190T	3.7	13	67.87	30	48.9	G	1	6	Y	N
LC03600245T	3.2	25	36.75	29	46.1	G	1	6	N	N
LC02601276T	3.6	21	51.26	30	44.9	G	2	6	Y	N
Grand Mean	4.1	14	73.20	27	48.4	G	2	5	Y	N
CV	9	27	16	3	8	-	1833	400	-	-
LSD	0.6	6	19.91	1	7	-	0	0	-	-

Seed used for post harvest quality evaluations was grown at Pullman, WA in 2007.

Conductivity is expressed as microsiemens per gram of seed.

Post Seed Soaking Color Evaluation: G = Good; F = Fair; P = Poor.

Cooking time determined by removing a small sub-sample at two minute intervals and mashed with a fork until deemed cooked.

Post Cooking Seed Color is rated as: 1 = Good; 2 = Fair; 3 = poor.

Post Cooking Broth Color is rated as: 4 = dark; 5 = Light; 6 = Muddy.

Seed Coat Separates From Cotyledon (Sloughs) During Cooking: Y = Yes; N = No.

Seed Cooks To Mush (Looses Rigidity And Individual Seed Identity): Y = Yes; N = No.

Cooking tests conducted on each of three seed lots soaked for 18 hours.

All data in the above table is the average of three 100 seed sub-samples.

Table 46. Western Regional Winter Lentil Selection - Agronomy Summary, Moccasin, MT 2007.
 Data from Chengci Chen and Karnes Neill, Central Agricultural Research.

ENTRY	Spring Stand (1-5)	Biomass Production		Grain Harvest			Grain Weights	
		Height (cm)	Dry Matter (lbs/ac)	Height (cm)	Yield (lbs/ac)	Moisture (%)	Test (lbs/bu)	Kernel (g/1000)
WA8649041	4.1	32.0 ^a	1994 ^a	38.8 ^a	1113	9.1	65.8	25.9
Morton	4.8 ^a	27.8	1958 ^a	35.0	1273	10.4 ^a	66.3	29.1
LC9440070R	4.0	28.5	1493	36.0 ^a	1094	9.4	61.4	46.9 ^a
LC9978057T	5.0 ^a	35.5 ^a		34.5	1525 ^a	11.1 ^a	66.1	31.1
LC02601276T	3.6	32.3 ^a	1211	33.8	944	8.7	66.9 ^a	33.4
LC03600190T	2.3	27.8	745	32.5	580	9.3	66.4	34.2
LC03600245T	2.9	30.3	1228	37.3 ^a	1067	9.0	67.0 ^a	29.1
LC03600232T	3.6	32.5 ^a	1361	36.3 ^a	962	8.9	67.2 ^a	33.2
Toni	4.4	30.0	1612	37.5 ^a	1098	9.6	65.4	26.6
LC03600218T	2.8	28.3		31.3	829	9.5	65.4	40.8
LC9976079	4.6 ^a	32.3 ^a	1753	39.3 ^a	1284	10.2	65.1	30.7
LC9978094	4.6 ^a	35.0 ^a	2222 ^a	36.5 ^a	1217	10.1	66.1	29.2
LC9979062	4.8 ^a	33.0 ^a	2266 ^a	36.8 ^a	1395 ^a	10.6 ^a	65.5	30.9
LC9979065	4.3	26.0	1564	34.3	1357 ^a	10.0	66.2	29.2
LC9979120	4.9 ^a	28.0	2060 ^a	33.0	1358 ^a	9.0	66.1	25.2
LC02600449T	1.6	27.5		28.0	593	9.2	65.1	36.9
LC03600295T	1.8	25.3		30.3	679	9.4	66.0	34.7
LC9977116	4.5 ^a	30.3		30.3	1475 ^a	10.4 ^a	66.4	30.9
LC9979016	4.6 ^a	33.5 ^a	1734	36.0 ^a	1262	9.9	65.6	27.6
LC9977019	5.0 ^a	34.0 ^a		32.3	1336 ^a	10.4 ^a	65.0	42.5
WA8649090	5.0 ^a	26.5		31.3	1636 ^a	10.1	66.5	24.5
Means (<i>n</i> = 84)	4.0	30.3	1657	34.3	1147	9.7	65.8	32.0
LSD _{0.05} (by t)	0.6	3.7	469	4.2	181	0.7	0.3	1.2
CV% (s/means)	10.2	8.5	19.8	8.7	11.1	5.0	0.4	2.6
F-value (20,60 df)	28.6	5.6	6.9	4.2	21.7	6.9	93.9	191.8

^a - Indicates values statistically equal to highest (in **bold**) based LSD_{0.05}

Table 47. Western Regional Winter Lentil Variety Trial, Wall, SD-2007.
Data from John Rickertsen, South Dakota State University.

Variety	Fall Stand Percent	Spring Stand Percent	Height Inches	Lodging 1-9*	Test Wt Lb/Bu	Yield Lb/A
Morton	90	45	13	0	64.8	512
WA8649041	90	53	14	0	65.2	272
LC944007R	90	36	13	0	66.7	240
LC9978057T	90	64	13	0	66.2	534
LC02601276T	90	5	10	0	66.3	76
LC03600190T	90	6	12	0	66.0	131
LC03600245T	90	9	13	0	65.9	185
LC03600232T	90	23	14	0	66.7	392
Mean	90	30.0	12.5	0	66.0	293
LSD (P=.05)	0.0	12.6	1.3	0	1.1	115.4
CV	0.0	28.5	4.3	0	1.1	26.8

* =No lodging, 9 = 100% lodged

Table 48. Western Regional Winter Lentil CPT, Wall, SD-2007.
Data from John R Rickertsen, South Dakota State University

No.	Name	Height inches	Sp Stand %	Yield Lb/Ac
1	Morton	13	45	512
2	WA8649041	13.5	52.5	272
3	LC944007R	13	36.3	240
4	LC9978057T	12.5	63.8	534
5	LC02601276T	10	5	76
6	LC03600190T	11.5	6.3	131
7	LC03600245T	13	8.8	185
8	LC03600232T	13.5	22.5	392
LSD (P=.05)		1.26	12.56	115.4
Standard Deviation		0.53	8.54	78.5
CV		4.28	28.46	26.81
Grand Mean		12.5	30	292.67
Bartlett's X2		0	18.78	14.53
P(Bartlett's X2)		1	0.005*	0.043*
Replicate F		0	2.943	10.331
Replicate Prob(F)		1	0.0566	0.0002
Treatment F		10	28.261	18.914
Treatment Prob(F)		0.0035	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Column 3: TY1 = 435.6*[3]

Rating Date: 7/20/2007

Chickpea Trials

Twelve chickpea entries in the Western Regional Chickpea Yield Trial were evaluated at 10 locations across six states. The entries comprised four checks, 'Troy', 'Dwelley', 'Sierra', and 'Dylan' and eight breeding lines including seven Café and one Spanish white types. The trials were conducted under dryland or irrigated conditions depending on the location. Information regarding experimental design, location and specific observations for some of the locations are included below. The checks Troy, Dwelley, Sierra and Dylan, produced average seed yields of 1153, 1272, 818 and 1163 lb/a, respectively. The highest yielding line in the trial was CA0090B347C (2103 lb/a), a café type, and is a candidate for release in 2008.

Table 49. Summary of Locations Participating in the 2006 Chickpea Western Regional Yield Trial

Location	Contact	Conditions	Nurseries		
			Seed Sent	Data Returned	Data Lost
Idaho					
Moscow	Stephen Guy	Dryland	✓	✓	
Montana					
Moccasin	Chengci Chen, Louise Strang	Dryland	✓	✓	
Nebraska					
Scottsbluff	David Baltensperger, Glen Fricke	Irrigated	✓	✓	
Mitchel	David Baltensperger, Glen Fricke	Dryland	✓	✓	
North Dakota					
Carrington	Steve Zwinger, Blaine Schatz	Dryland	✓	✓	
Hettinger	Eric Eriksmoen	Dryland	✓		✓
Minot	Mark Halvorson	Dryland	✓		✓
Williston	Neil Riveland	Dryland	✓	✓	
South Dakota					
Hayes	John Rickertsen	Dryland	✓		✓
Wall	John Richertsen	Dryland	✓	✓	
Wyoming					
Torrington	Jack Cecil	Dryland	✓	✓	
Grand Totals			11	8	3

Table 50. Location Yield Summary (lb/a) for Western Regional Chickpea Trails-2007.

Location	DWELLEY	CA0090B347C	CA0390B007C	CA0390B440C	CA0469C020C	CA0469C025C	CA9783163C	CA9890233W	CA9990B1579C	DYLAN	SIERRA	TROY
Moscow, ID	1000	1725	...	...	1810	...	...	...	...	1650	1460	1315
Moccasin, MT	578	932	...	...	...	...	764	802	710	979	605	...
Carrington, ND	1127	1260	2236	2091	1886	1732	1309	1265	1475	1706	1113	1984
Mitchell, NE Non-Protected	84	138	...	...	133	...	33	56	275	121	175	9
Mitchell, NE Protected	119	90	...	...	207	...	25	16	163	273	240	3
Scottsbluff, NE Non-Protected	144	109	...	...	442	...	274	133	343	197	376	72
Scottsbluff, NE Protected	272	376	...	...	551	...	336	228	390	425	455	107
Torrington, WY	2307	4240	2832	3576	1780	2955	1148	1360	1240	1164	...	...
Williston, ND	...	283	...	...	...	...	...	...	...	...	63	...
Wall, SD	383	810	671	401	984	906	1032	679	714	619	523	322
Mean	1272	2103	1913	2023	1550	1864	1163	1101	1143	1163	818	1153

Table 51. Post Harvest Quality evaluations of Kabuli Chickpea Lines in the Western Chickpea Trials-2007.

Name	100 Seed Weight	Hard Seed	Water Uptake	Cooking Time	Conductivity	Post Soak Seed Color	Post Cook Seed Color	Post Cook Broth Color	Seed Coat Separates	Cooked to Mush
DWELLEY	54.4	0	108	21	37.34	G	1	4	N	N
SIERRA	54.9	0	103	21	45.39	G	1	4	N	N
CA9783163C	56.9	0	112	19	28.52	G	1	4	N	N
CA9890233W	55.9	0	118	19	35.14	G	1	4	N	N
CA9990B1579C	56.4	0	101	21	44.07	G	1	4	N	N
DYLAN	60.8	0	113	20	25.15	G	1	4	N	N
TROY	60.0	0	118	20	33.06	G	1	4	N	N
CA0090B347C	45.0	0	107	18	39.78	G	1	4	N	N
CA0390B007C	51.7	0	102	20	32.74	G	1	4	N	N
CA0390B440C	47.2	0	106	18	35.11	G	1	4	N	N
CA0469C020C	40.3	0	111	21	38.5	G	1	4	N	N
CA0469C025C	41.1	0	113	21	41.37	G	1	4	N	N
Grand Mean	55.2	0	109	20	36.26	G	1	4	N	N
CV	2.6	-	3.2	4.2	6.0	-	-	-	-	-
LSD	2.4	-	6	1	4	-	-	-	-	-

Table 52. Chickpea Variety Performance Results, Moscow, ID-2007.
 Data from Stephen Guy, University of Idaho.

Variety or Selection	Seed Yield lb/acre	Seed Weight g/100	Plant Height inches
Dwelley	1000	46.9	16
Dylan	1650	52.1	14
Myles	1690	19.1	15
Sierra	1460	48.8	16
Spanish White	1530	53.1	14
Troy	1315	41.4	13
CA0090B347C	1725	44.5	17
CA0469C020C	1810	39.3	16
Average	1525	43.1	15
LSD (0.10)	140	4.7	1
CV (%)	8	8.9	7

Table 53. Seed Yield Averages for Chickpea Varieties Tested for Three Years in Northern Idaho.

Data from Stephen Guy, University of Idaho.

Variety or Selection	2005	2006	2007	Average
	-----lb/acre-----			
	-			
Dwelley	220	1410	1000	875
Dylan	530	1620	1650	1265
Myles	800	1700	1690	1395
Sierra	480	1530	1460	1155
Spanish White	640	970	1530	1045
Troy	360	1270	1315	980
CA0090B347C	830	1830	1725	1460
Average	551	1415	1440	1135
LSD (0.10)	70	191	140	-

Table 54. Western Regional Chickpea Trial Grown Under Non-irrigated Conditions, Mitchell, NE-2007. Data from Carlos Urrea, University of Nebraska.

ENTRY No.	Pedigree	Yield Lbs/A	Vigor (1-5)†	100 seed Weight gr	Seeds/lb #/lb	Adaptation (1-5)†
Non-Protected						
12	PI Bulk	364	3.0	30.1	1510	3.1
14	HB 14	312	2.4	45.4	1001	2.4
10	CA9990B1579C	275	2.6	45.2	1005	3.1
7	CA0469C025C	270	2.5	38.4	1184	2.4
13	B90	268	3.6	28.1	1614	3.6
11	PI 17256	255	3.4	35.1	1295	3.1
3	Sierra	175	2.8	44.6	1019	3.4
5	CA0090B347C	138	2.3	40.7	1117	2.8
6	CA0469C020C	133	2.3	37.0	1226	2.3
2	Dylan	121	2.5	49.8	916	4.3
15	HB 19	94	2.8	51.8	877	2.5
1	Dwelley	84	2.6	44.7	1016	3.6
9	CA9890233W	56	2.8	51.2	888	4.3
8	CA9783163C	33	2.5	43.1	1096	4.4
4	Troy	9	2.5	34.0	1354	4.5
Protected						
7	CA0469C025C	333	2.4	38.1	1192	2.0
14	HB 14	332	2.6	46.7	974	2.6
11	PI 17256	330	3.3	34.6	1315	3.4
12	PI Bulk	289	3.0	31.5	1439	3.5
13	B90	283	3.6	27.4	1661	3.8
2	Dylan	273	2.6	52.5	864	3.8
3	Sierra	240	2.6	43.8	1041	3.1
6	CA0469C020C	207	2.3	37.5	1210	2.3
10	CA9990B1579C	163	1.9	42.9	1059	3.3
15	HB 19	142	2.4	52.8	860	2.8
1	Dwelley	119	2.4	44.5	1021	3.6
5	CA0090B347C	90	2.4	40.6	1120	2.4
8	CA9783163C	25	2.6	44.1	1034	4.4
9	CA9890233W	16	2.6	50.7	903	4.6
4	Troy	3	2.8	-	-	4.9
GRAND MEAN		181	2.7	41.3	1140.3	3.3
LSD (P=0.05)		115	0.4	2.7	78.0	0.5
CV %		32.0	0.6	3.3	3.5	0.7

† 1= Excellent; 3= Intermediate; 5= Very Poor

Table 55. Western Regional Chickpea Trial, Agronomic Summary, Moccasin, MT-2007.
Data from Chengci Chen and Karnes Neil

Selection	Canopy Height	Yield	Moisture	Grain Weights	
				Test	Kernel
Majoret	54.3 ^a	1290	11.5	64.4	185.8
Delta	52.8	1627 ^a	12.1 ^a	65.0 ^a	202.1
Stirling	45.5	1360	11.0	63.4	178.3
Medora	58.0 ^a	1007	11.6	63.3	167.1
PS0010836	45.3	1551 ^a	11.6	63.4	213.3
PS01102958	44.3	1409 ^a	11.7 ^a	64.6	218.1
PS02100107	47.8	1495 ^a	11.3	64.0	194.6
PS03100278	57.0 ^a	1440 ^a	11.0	64.0	206.0
PS03100280	55.5 ^a	1549 ^a	11.3	64.3	209.6
PS03101340	59.0 ^a	1486 ^a	10.9	62.8	235.5 ^a
PS03101445	54.3 ^a	1408 ^a	11.2	63.3	178.4
PS03101459	56.5 ^a	1301	11.6	64.4	187.4
PS03101822	45.8	1562 ^a	11.4	63.4	218.0
Means (<i>n</i> = 52)	52.0	1422	11.4	63.9	199.5
LSD _{0.05} (by t)	6.0	237	0.4	0.4	8.0
C.V. % (s/means)	8.02	11.63	2.71	0.48	2.8
F-Value (12, 36 df)	6.88	3.81	4.6	18.33	49.43

^a - denotes values equal to the largest value (in **bold**) based on LSD_{0.05}.

Table 56 .Western Regional Chickpea Trial Grown Under Irrigated Conditions, Scottsbluff, NE-2007.

Data from Carlos Urrea, University of Nebraska.

ENTRY No.	Pedigree	Yield	Vigor	100 seed Weight	Ascochyta Blight	Seeds/lb	Adaptation	Root Rot	Root Rot	
		Lbs/A	(1-5)†	gr	(1-5)‡	#/lb	(1-5)†	%	(1-5)	
		Non-Protected								
12	PI Bulk	1000	2.6	28.6	1.4	1590	1.5	21.3	1.9	
14	HB 14	788	2.0	42.1	2.6	1079	2.6	23.8	2.1	
7	CA0469C025C	538	2.3	32.1	2.1	1420	2.9	35.0	2.8	
6	CA0469C020C	442	2.3	35.5	2.3	1282	3.5	47.5	3.4	
3	Sierra	376	2.4	39.8	2.4	1143	3.4	43.8	3.1	
11	PI 17256	357	3.3	33.0	1.8	1379	3.0	41.3	3.0	
15	HB 19	356	1.8	46.2	2.5	985	3.4	41.3	3.0	
10	CA9990B1579C	343	1.9	38.4	2.6	1182	3.5	47.5	3.5	
13	B90	279	2.8	24.0	1.9	1893	3.1	33.8	2.8	
8	CA9783163C	274	2.6	41.9	2.9	1085	3.5	22.5	2.3	
2	Dylan	197	2.3	42.6	2.5	1066	4.0	51.3	3.5	
1	Dwelley	144	2.5	37.5	2.6	1219	3.8	31.3	2.5	
9	CA9890233W	133	2.4	38.4	2.5	1182	4.0	36.3	2.8	
5	CA0090B347C	109	2.4	37.8	2.5	1213	4.3	32.5	2.6	
4	Troy	72	2.3	33.9	2.5	1442	3.8	41.3	3.3	
		Protected								
12	PI Bulk	1020	3.1	28.4	1.4	1603	1.9	31.3	2.3	
7	CA0469C025C	971	2.6	36.9	1.5	1233	2.6	37.5	2.5	
14	HB 14	844	2.4	42.4	1.6	1072	2.5	32.5	2.5	
15	HB 19	660	2.5	47.6	1.9	955	2.9	50.0	3.3	
11	PI 17256	571	3.0	32.6	1.5	1394	2.6	48.8	3.0	
6	CA0469C020C	551	2.5	36.7	1.9	1239	3.0	57.5	3.5	
3	Sierra	455	2.5	39.6	1.9	1158	3.0	51.3	3.4	
2	Dylan	425	2.5	45.2	1.9	1007	3.4	45.0	3.1	
13	B90	412	2.5	29.3	1.5	1622	2.8	51.3	3.1	
10	CA9990B1579C	390	2.3	36.7	1.6	1240	3.0	50.0	3.1	
5	CA0090B347C	376	2.5	38.8	1.6	1173	3.4	32.5	2.5	
8	CA9783163C	336	2.5	43.3	1.9	1048	3.5	23.8	2.0	
1	Dwelley	272	2.6	38.8	1.9	1174	3.0	31.3	2.4	
9	CA9890233W	228	2.6	43.2	2.0	1053	3.3	41.3	2.8	
4	Troy	107	2.1	36.1	1.9	1381	3.6	41.3	3.0	
GRAND MEAN		434	2.5	37.6	2.0	1250	3.2	39.2	2.8	
LSD (P=0.05)		215	0.4	3.6	0.4	164	0.5	9.7	0.5	
CV %		25.0	0.6	4.9	0.7	6.7	0.7	12.5	0.7	

† 1= Excellent; 3= Intermediate; 5= Very Poor

‡ Resistant: No visible disease symptoms; 3= Intermediate: Approximately 10% of the leaf area is covered by small lesions that are beginning to coalesce; 5= Susceptible: More than 50% of the leaf surface area is covered with large coalescing lesions. § 1, 2, 3= Resistant; 4, 5, 6= Intermediate; 7, 8, 9= Susceptible.

Table 57. NDSU Carrington Research Extension Center Western Regional Chickpea Nursery, Carrington, ND-2007. Data from Blaine Schatz and Steve Zwinger, North Dakota State University.

Obs	Variety	Market Class	Leaf Type	Days to Flower	Plant Ht	Pod Ht	Seed Size > 10 mm	Seed Size > 9 mm	Seed Size > 8 mm	Seed Size > 7 mm	100 KWT	Seeds / Pound	Test Weight	Seed Yield
					cm	cm	%	%	%	%	gms		lbs/bu	lbs/ac
1	CA0090B347C	Café'	Simple	47.3	37.3	6.3	21.3	37.1	27.4	11.5	41.4	1100	59.0	1260
2	CA0390B007C	Café'		52.7	44.0	6.8	32.8	39.4	20.4	5.7	48.5	942	58.1	2236
3	CA0390B440C	Café'		53.0	46.7	6.8	23.4	38.8	26.2	9.1	41.2	1103	59.0	2091
4	CA0469C020C	Café'		46.3	31.3	5.8	8.1	44.7	34.1	10.5	40.3	1127	60.0	1886
5	CA0469C025C	Café'		47.7	32.0	5.8	7.0	44.4	36.4	9.8	40.2	1129	59.9	1732
6	CA9783163C	Café'	Compound	49.0	36.7	6.3	27.7	34.8	21.6	10.9	42.4	1090	56.5	1309
7	CA9890233W	White	Compound	49.0	32.7	6.0	29.5	32.3	24.2	11.4	40.7	1117	55.1	1265
8	CA9990B1579C	Café'	Simple	47.7	38.0	6.6	33.9	35.2	21.7	6.6	46.3	981	58.3	1475
9	Dwelley	Café'	Simple	51.7	37.3	6.6	39.9	36.3	17.8	3.4	48.7	936	58.9	1127
10	Dylan	Café'	Compound	46.7	32.0	5.8	31.9	39.0	22.4	5.0	47.5	960	55.9	1706
11	Sierra	Café'	Simple	47.7	36.0	6.0	32.9	39.7	20.4	5.3	46.8	971	59.9	1113
12	Troy	White	Compound	48.7	34.0	6.0	35.7	35.5	18.4	7.5	45.7	997	55.9	1984
		MEAN		48.9	36.5	6.2	26.8	38.1	24.4	8.1	44.0	1040	58.0	1580
		C.V.%		2.3	7.2	6.9	19.6	14.3	16.7	42.1	5.9	6.0	2.0	23.7
		LSD.05		1.9	4.4	0.7	8.9	NS	6.9	NS	4.4	107	2.0	636
		LSD.01		2.6	6.0	NS	12.2	NS	9.4	NS	6.0	145	2.7	NS
		#REPS		3	3	3	3	3	3	3	3	3	3	3

Planting Date = May 9 ; Harvest Date = September 28 ; Previous Crop = Spring Wheat

** The seed size data as reported reflect the % of the seed sample remaining on top of the sieves stacked in series.

** Ascochyta disease was present throughout this nursery.

Table 59. Western Regional Chickpea Variety Trail, Williston, ND-2007.
Data from Neil Riveland, Williston Research Extension Center.

Cultivar	Days to Bloom	Canopy Height		1000 Kwt	Seeds per Pound	Test Weight	Seed Yield
		cms	inches				
CA0469C025C	53	32.7	12.9	309.1	5871	62.7	601.1
Sierra	56	27.7	10.9	319.9	14183	45.7	62.5
CA9990B1579C	55	29	11.4	339.8	13349	56	95.7
CDC Anna (Desi)	53.7	28	11	172	10549	56.9	381.7
CDC Frontier	54	27.3	10.7	295.5	6140	60.1	786.2
CA0469C020C	53.7	27	10.6	310.3	5847	59.8	594.4
CA0090B347	55.3	29.7	11.7	343.9	5276	57.6	282.6
HIGH MEAN	56	32.7	12.9	343.9	14183	62.7	786.2
LOW MEAN	53	27	10.6	172	5276	45.7	62.5
EXP MEAN	54.4	28.8	11.3	298.6	8745	57	400.6
C.V. %	1.3	5.6	5.7	1.2	1	4.3	14.7
LSD 5%	1.2	2.9	1.1	8.8	315	6	104.6
LSD 1%	1.7	NS	NS	13.4	478	9	146.6
# OF REPS	3	3	3	2	2	2	3
F-TRT	7.5	4.5	4.5	524.3	1796	10	64.8

Location of the WREC: Latitude 48° 8'; Longitude 103° 44' W; Elevation 2105 ft.
Planted: May 10 on Fallow. Applied Fertilizer in lbs/a: 0N:0P2O5:0K:
Soil Test to two feet in lbs/a: 96N:22P:300K:42S1.6 OM pH-5.5
Soil Type: Williams-Bowbells Loam
Harvested: September 6 Harvested Area: 60 ft²
Trifluralin applied at 1 lb/a ai PPI for weed control.

Rabbits enjoyed the chickpeas early in the season. Ascochyta blight infection then severely damaged chickpea varieties that had no tolerance to that disease. No fungicides were used. The varieties Sierra and Ca9990B1579C were harvested to demonstrate their susceptibility to ascochyta blight. Frontier and two experimental lines were quite tolerant of the disease.

Table 60. SDSU Kabuli Chickpea Variety Trial- Wall, SD-2004-2007.
Data from John Rickertsen, South Dakota State University.

Variety	Seed Color	Height Inches	Lodging 0-9*	Test Wt Lb/Bu	Yield Lb/A 2007	Yield Lb/A 4 Year
<u>Large Kabuli</u>						
Dwelly	Cream	18	0	57.6	383	972
Sierra	Cream	17	0	60.4	523	1065
Dylan	Cream	15	0	57.9	619	1123
Troy	Cream	16	0	57.3	322	782
CDC Xena	Cream	15	0	59.4	627	1112
CDC Yuma	Cream	17	0	58.7	575	1038
Small Kabuli						
Amit (B-90)	Cream	18	0	61.0	619	1112
Desi						
CDC Anna	Brown	16	0	59.8	784	1189
<u>Large Kabuli experimentals</u>						
CA9783163C	Cream	18	0	57.7	470	1032
CA9890233W	White	16	0	57.0	340	679
CA9990B1579C	Cream	17	0	59.1	714	--
CA0090B347C	Cream	17	0	60.7	810	1283
CA0390B007C	Cream	18	0	60.5	671	--
CA0390B440C	Cream	18	0	59.8	401	--
CA0469C020C	Cream	16	0	60.6	984	--
CA0469C025C	Cream	17	0	60.4	906	--
Average						
		16.7	0.0	59.2	609	1035
LSD (P=.05)						
		1.6	0.0	.	110	
CV						
		6.5	0.0	.	12.6	16.9

*0=No lodging, 9= 100% lodged.

Table 61. SDSU Kabuli Chickpea Seed Size Grades- Wall,SD-2007.
Data from John Rickertsen, South Dakota State University

Variety	under 18/64"	over 18/64"	over 20/64"	over 22/64"
Large Kabuli				
Dwelly	24%	25%	31%	20%
Sierra	21%	31%	35%	13%
Dylan	13%	15%	40%	32%
Troy	28%	26%	30%	16%
CDC Xena	8%	18%	43%	31%
CDC Yuma	20%	36%	39%	5%
Small Kabuli				
Amit (B-90)	88%	11%	1%	0%
Desi				
CDC Anna	92%	8%	0%	0%
Large Kabuli experimentals				
CA9783163C	42%	29%	21%	8%
CA9890233W	41%	27%	24%	8%
CA9990B1579C	13%	24%	41%	22%
CA0090B347C	3%	13%	56%	28%
CA0390B007C	8%	29%	51%	12%
CA0390B440C	54%	27%	12%	7%
CA0469C020C	9%	39%	48%	4%

Table 62. Western Regional Chickpea Yield Trial- Torrington, WY-2007.
Data from Jack Cecil

Entry	Yield Lb/A
CA9783163C	1148
CA9890233W	1360
CA9990B1579C	1240
CA0090B347C	4240
CA0390B007C	2832
CA0390B440C	3576
CA0469C020C	1780
CA0469C025C	2955
Dwelly	2307
Dylan	1164
Mean	2308
CV	16.67
LSD	1129