Dry Pea, Lentil, Chickpea and Winter Legume Breeding

2002 Progress Report

Prepared by

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Spring Pea Yield Testing

Advanced breeding lines of green, yellow and marrowfat peas were compared in yield trials at Pullman, Fairfield and Walla Walla, WA, and at Genesee, ID (Tables 1, 6, and 11). Trials in 2002 produced average yields compared to previous years (Tables 4, 9, and 14). The trial at Pullman produced the greatest yield overall followed by Genesee, Walla Walla and Fairfield. In addition to advanced and preliminary trials in the Palouse, a small trial of twenty early generation breeding lines was evaluated at three North Dakota environments, Minot, Carrington and Hettinger. Inclement weather resulted in the loss of the trial at Hettinger, but the other locations provided excellent results. This was the first year of this trial and with the encouraging results we hope to continue the trial in the future.

Green Pea Trial Results

The advanced green pea yield trial contained 10 experimental lines from the USDA breeding program and 18 checks from the USDA and other breeding programs. Seed yield for 'Lifter' (1938 kg/ha), a recent release from the USDA program, was slightly above the trial mean (1850 kg/ha). Lifter continues to show a yield advantage compared to 'Columbian' and other cultivars. Among the top yielding lines in the 2002 trial were PS810240, PS810191 and PS610152. Among these three lines, PS610152 has the most favorable combination of consistent yield, upright growth habit (height index = 0.87), excellent seed quality and disease resistance (Tables 2 and 3). This line will be proposed for full cultivar release in the spring of 2003. Increase of Breeder Seed is underway in southern California and Foundation seed will be produced in the Palouse during the 2003 season. This cultivar should be available to growers for the 2004 season.

Physical appearance and cooking quality are priorities in the breeding program. Overall quality was good in 2002 with seed bleach at a low level. It has been an objective of the breeding program to develop upright plant types. All the green pea breeding lines have been selected to have the semi-leafless (afila) leaf type which contributes to upright growth. Plant height index for the breeding lines in the 2002 trial ranged from 0.52 to 0.87 and averaged 0.72, a significant improvement over previous years. Additional selection for improved stem properties will continue to improve overall plant stature.

The preliminary yield trial for green pea selections containing 7 experimental lines and seven checks was planted at Pullman, WA (Table 5). All breeding lines out-yielded 'Joel', Lifter and Columbian and had excellent agronomic characteristics. PS0010128 was the highest yielding breeding line (2439 kg/ha) and maintained a plant height of index of 0.72 despite normal leaf morphology. PS99102238, another superior line, produced a high yield (2336 kg/ha) and maintained a plant height index of 0.91.

Disease Screening

All pea selections in the advanced and preliminary yield trials were screened at Corvallis, OR for resistance to PEMV. Resistance to Fusarium wilt race 1 was evaluated at the Spillman Research Farm dedicated to the disease. Individual selections with resistance identified in these trials are being used to transfer their respective resistances to new varieties.

Variety Releases

Lifter and Franklin were released in 2000 from the pea breeding program. Release of a new green cotyledon pea, selection number PS610152, is proposed for spring of 2003. PS610152 has been under test for the past six years and has been among the highest yielding lines in Pacific Northwest field trials. It has excellent seed quality and is resistant to seed bleaching. It maintains an upright growth habit through harvest due to the combination of stiff stems and the semi-leafless trait. The upright growth habit will provide greater ease of harvest and improve crop quality through reduced foreign matter harvested with the seed. Breeder seed is being increased in southern California during the winter of 2002-2003. Foundation seed will be produced in the Palouse during the 2003 season and seed will be available to producers in spring 2004.

Table 1. Location Yield Summary (kg/ha) for the Advanced Green Dry Pea Yield Trial, 2002 (0201)

Cultivar	Origin	Leaf Type	Plant Type	Fairfield	Genesee	Pullman	Walla Walla	Mean Seed Yield
CEB-1171	-------	-	-	1734	2399	2535	2126	2198
Bluebird	-------	-	-	1693	2085	2390	2163	2083
PS810240	X94P106	-	-	1606	2315	2387	1914	2056
Karita	-------	-	-	1753	2210	2376	1870	2052
PS810191	X94P164	-	-	1466	2407	2469	1841	2046
PS610152	X93P022	-	-	1540	2109	2277	2172	2025
Hero	-------	-	-	1453	2199	2164	2213	2007
PS810162	X94P058	-	-	1394	2199	2215	2165	1993
CDC-Verdi	-------	-	-	2093	1919	2451	1458	1980
PRO-98106	-------	-	-	1687	2044	2163	1962	1964
PS9910346	X93P123	-	-	1536	2139	2167	1980	1955
Lifter	X93P045	+	-	1568	2195	2037	1951	1938
PS9910592	X95P122	-	-	1390	2231	2382	1710	1928
Ariel	-------	-	-	1511	2093	2174	1867	1911
PS710048	X92P202	-	-	1614	2246	2411	1370	1910
Joel	X84F172	+	+	1587	2121	2050	1875	1908
Cruiser	-------	-	-	1543	2135	2008	1875	1890
PS9910079	X95P118	+	-	1569	1877	2179	1868	1873
PS9910484	X94P081	-	-	1450	2120	2269	1653	1873
PS610324	X93P192	-	-	1170	2119	2104	1954	1837
CDC-Montero	-------	-	-	1446	1930	2345	1573	1824
Columbian	-------	+	+	1693	2044	2045	1456	1809
CEB-1170	-------	-	-	1300	2029	2211	1479	1755
Franklin	X93P046	+	-	1194	1892	1998	1848	1733
Columbian(Lot I)	-------	+	+	1568	1912	1987	1445	1728
CMG-1002	-------	+	+	1344	2107	2006	1376	1708
Toledo	--------	-	-	1349	1744	1857	1624	1644
CMG-1003	-------	+	-	1156	1645	1732	1225	1439
Grand Mean				1514	2088	2193	1786	1850
C.V. (%)				12	9	4	16	11
LSD $_{(\alpha=0.05)}$				247	259	114	386	159
Planting Date				4/29/2002	4/22/2002	4/26/2002	4/25/2002	
Harvest Date				8/20/2002	7/30/2002	7/30/2002	7/25/2002	

Leaf type; + =normal leaf, - =*afila* or semileafless type.
Plant type; + =tall plant type, - =short plant type.
Yield data are means of three replications at each location, over four locations.

Table 2. Agronomic Data for the Advanced Green Dry Pea Yield Trial, 2002 (0201)

Cultivar	Origin	Plant Ht (green) Fairfield	Plant Ht (green) Genesee	Plant Ht (green) Pullman	Plant Ht (green) Walla Walla	Mean Plant Ht (green)	Plant Ht (mature) Fairfield	Plant Ht (mature) Genesee	Plant Ht (mature) Pullman	Plant Ht (mature) Walla Walla	Mean Plant Ht (mature)	Plant Ht Index Fairfield	Plant Ht Index Genesee	Plant Ht Index Pullman	Plant Ht Index Walla Walla	Mean Plant Ht Index	Rep Nodes Fairfield	Rep Nodes Genesee	Rep Nodes Pullman	Rep Nodes Walla Walla	Mean Rep Nodes
		..cm..	..cm..	..cm..	..cm..	..cm..	..cm..	..cm..	..cm..	..cm..	..cm..										
CEB-1171	-------	44	56	47	55	51	38	55	40	52	46	0.92	0.92	0.82	0.94	0.90	3	4	3	5	4
Bluebird	-------	39	49	43	55	47	37	50	38	55	45	0.95	0.94	0.90	0.96	0.94	2	4	4	4	4
PS810240	X94P106	57	77	60	78	68	38	34	32	59	41	0.66	0.44	0.58	0.71	0.60	2	3	2	3	3
Karita	-------	52	70	54	69	61	48	65	50	63	57	0.95	0.86	0.89	0.94	0.91	3	5	4	5	4
PS810191	X94P164	41	58	55	58	53	36	51	40	41	42	0.85	0.85	0.81	0.63	0.79	3	5	4	4	4
PS610152	X93P022	38	56	48	60	51	32	55	42	52	45	0.84	0.88	0.91	0.83	0.87	4	5	6	4	5
Hero	-------	40	64	52	60	54	33	54	43	48	45	0.85	0.92	0.84	0.81	0.86	3	3	3	4	3
PS810162	X94P058	37	58	49	58	51	35	46	42	47	43	0.87	0.81	0.85	0.84	0.84	3	4	5	4	4
CDC-Verdi	-------	66	71	61	64	66	52	65	50	58	56	0.78	0.91	0.86	0.95	0.88	5	5	4	4	5
PRO-98106	-------	43	67	51	59	55	36	49	37	39	40	0.82	0.81	0.75	0.73	0.78	4	4	3	4	4
PS9910346	X93P123	50	64	56	67	59	35	39	38	42	39	0.69	0.58	0.74	0.63	0.66	5	3	6	7	5
Lifter	X93P045	72	87	62	76	74	44	35	30	19	32	0.62	0.41	0.47	0.29	0.45	5	6	4	4	5
PS9910592	X95P122	37	59	44	57	49	25	51	33	22	33	0.67	0.87	0.80	0.34	0.67	2	4	3	3	3
Ariel	-------	55	72	58	75	65	51	66	54	63	59	0.94	0.93	0.84	0.91	0.91	3	4	3	5	4
PS710048	X92P202	44	74	48	58	56	35	57	45	41	45	0.79	0.89	0.93	0.66	0.82	3	3	3	5	4
Joel	X84F172	98	113	101	129	110	38	39	33	37	37	0.44	0.31	0.35	0.26	0.34	6	5	3	5	5
Cruiser	-------	56	80	61	73	68	45	74	53	70	61	0.80	0.94	0.82	0.92	0.87	5	7	5	5	6
PS9910079	X95P118	50	69	56	64	60	26	30	30	34	30	0.54	0.44	0.51	0.57	0.52	4	4	4	4	4
PS9910484	X94P081	51	67	56	66	60	33	55	34	28	38	0.63	0.79	0.62	0.39	0.61	2	3	3	5	3
PS610324	X93P192	59	71	54	67	63	45	63	47	52	52	0.78	0.92	0.83	0.80	0.83	3	4	3	3	3
CDC-Montero	-------	57	76	57	67	64	47	51	52	50	50	0.81	0.64	0.83	0.82	0.78	3	3	4	5	4
Columbian	-------	84	100	88	98	93	38	41	30	37	37	0.47	0.40	0.38	0.40	0.41	4	5	6	5	5
CEB-1170	-------	59	85	69	77	73	49	72	50	66	59	0.86	0.84	0.75	0.84	0.82	5	5	6	7	6
Franklin	X93P046	48	57	43	57	51	26	12	13	16	17	0.55	0.26	0.29	0.33	0.36	2	3	2	4	3
Columbian(Lot I)	-------	82	98	82	91	88	40	42	36	38	39	0.53	0.40	0.39	0.30	0.41	6	7	6	6	6
CMG-1002	-------	66	87	68	77	75	28	36	30	41	34	0.44	0.41	0.52	0.53	0.48	5	5	4	6	5
Toledo	--------	56	76	60	74	67	55	66	48	62	58	0.97	0.89	0.81	0.86	0.88	3	4	4	4	4
CMG-1003	-------	41	63	45	58	52	30	47	35	36	37	0.73	0.79	0.70	0.59	0.70	4	4	4	5	4

Table 2. Agronomic Data for the Advanced Green Dry Pea Yield Trial, 2002 (0201) Continued

Cultivar	Origin	Plant Ht (green) Fairfield	Plant Ht (green) Genesee	Plant Ht (green) Pullman	Plant Ht (green) Walla Walla	Mean Plant Ht (green)	Plant Ht (mature) Fairfield	Plant Ht (mature) Genesee	Plant Ht (mature) Pullman	Plant Ht (mature) Walla Walla	Mean Plant Ht (mature)	Plant Ht Index Fairfield	Plant Ht Index Genesee	Plant Ht Index Pullman	Plant Ht Index Walla Walla	Mean Plant Ht Index	Rep Nodes Fairfield	Rep Nodes Genesee	Rep Nodes Pullman	Rep Nodes Walla Walla	Mean Rep Nodes
		..cm..	..cm..	..cm..	..cm..	..cm..	..cm..	..cm..	..cm..	..cm..	..cm..										
Grand Mean		54	72	59	70	65	39	50	40	45	46	0.74	0.72	0.70	0.67	0.71	4	4	4	5	4
C.V. (%)		11	9	8	7	9	13	12	9	12	11	12	12	12	12	12	25	21	21	26	24
LSD (α=0.05)		8	9	6	7	5	7	8	5	7	4	0.12	0.12	0.11	0.11	0.07	1	2	1	2	1

Pod and plant height were measured at the green pod stage and at harvest maturity.

Plant height indices were determined by dividing the value at harvest maturity by the green pod stage value.

Rep Nodes are total number of reproductive nodes with a pod containing seed.

Agronomic data are means of three replications at each location, means are three replications over all four locations.

Table 3. Agronomic Data for the Advanced Green Dry Pea Yield Trial, 2002 (0201)

Cultivar	Origin	Disease FW	Disease PM	Disease Virus	% Bleach	% Hard Seed	Days to Flower	Days to Maturity	Nodes to First Flower	Pods/ Peduncle	Pod Height (green)	Pod Height (mature)	Pod Height Index	Weight 100 Seeds
											..cm..	..cm..		..g..
CEB-1171	-------	+	..	2	84	0	59	90	14	2	40	24	0.61	21.7
Bluebird	-------	+	..	2	29	0	58	88	15	2	35	23	0.67	20.2
PS810240	X94P106	+/-	..	3	12	1	60	90	17	2	49	14	0.31	19.7
Karita	-------	+/-	+	4	41	1	56	89	18	2	44	33	0.77	23.9
PS810191	X94P164	+	..	1	18	0	59	90	18	2	42	18	0.44	19.0
PS610152	X93P022	+	..	3	16	0	56	90	14	2	30	25	0.83	19.3
Hero	-------	+	..	2	100	0	60	89	17	2	46	29	0.66	21.3
PS810162	X94P058	+	..	2	20	1	53	88	13	2	31	20	0.61	21.1
CDC-Verdi	-------	+	..	2	39	0	61	92	20	2	46	30	0.65	19.8
PRO-98106	-------	+	..	4	44	0	54	86	12	2	33	25	0.74	18.8
PS9910346	X93P123	+	..	3	74	0	53	87	12	2	29	14	0.46	19.1
Lifter	X93P045	+	..	1	27	1	60	91	15	2	50	11	0.23	20.9
PS9910592	X95P122	+	..	2	32	0	58	89	14	3	33	25	0.73	19.1
Ariel	-------	+	+	3	37	1	58	87	18	2	47	33	0.69	17.0
PS710048	X92P202	+/-	..	2	28	0	59	89	16	2	42	29	0.68	22.1
Joel	X84F172	+	..	3	22	1	55	90	14	2	72	8	0.08	21.5
Cruiser	-------	+	..	3	98	0	58	88	17	2	49	36	0.78	18.8
PS9910079	X95P118	+	..	3	9	0	53	87	13	2	37	7	0.20	19.8
PS9910484	X94P081	+	..	1	17	0	59	89	19	2	47	17	0.39	17.0
PS610324	X93P192	+	..	3	6	0	59	88	18	2	48	31	0.65	21.4
CDC-Montero	-------	+/-	..	3	66	1	61	91	18	2	46	31	0.68	19.7
Columbian	-------	+	..	5	33	1	52	89	9	2	33	9	0.27	19.6
CEB-1170	-------	+	+	3	46	0	57	90	16	2	51	30	0.60	26.3
Franklin	X93P046	+	..	5	23	0	60	88	16	2	36	6	0.11	18.9
Columbian(Lot I)	-------	+	..	1	16	1	53	87	8	1	33	4	0.12	19.5
CMG-1002	-------	+	+	2	16	0	51	87	8	2	32	17	0.53	18.3
Toledo	--------	…	..	4	73	0	56	87	18	2	45	28	0.63	22.3
CMG-1003	-------	+	..	5	98	0	55	87	12	2	24	13	0.55	11.1
Grand Mean							57	89	15	2	41	21	0.52	19.9
C.V. (%)							1	1	6	5	10	18	21	
LSD (α=0.05)							1	1	1	0	6	5	0.15	

Pod height was measured at the green pod stage and at harvest maturity.

Pod height indices were determined by dividing the value at harvest maturity by the green pod stage value.

Fw=Fusarium wilt race 1; + =resistant, - =susceptible

PM=Powdery mildew; - =resistant, + =susceptible

Virus=Virus complex; 1 =no infection, 2 =less than 1% of plants affected, 3 =2-5% plants affected, 4 =6-10% plants affected, 5 => 10% plants affected

Yield data are means of three replications at Pullman, WA.

Table 4. Mean Yields (kg/ha) from Advanced Green Dry Pea Yield Trial 1998-2002

Cultivar	Origin	Leaf Type	Plant Type	1998	1999	2000	2001	2002
CEB-1171	-------	-	-	....	....	....	3059	2198
Bluebird	-------	-	-	....	2392	1891	2893	2083
PS810240	X94P106	-	-	....	....	....	2532	2056
Karita	-------	-	-	....	....	1698	2544	2052
PS810191	X94P164	-	-	....	....	....	2627	2046
PS610152	X93P022	-	-	....	2209	1792	2625	2025
Hero	-------	-	-	....	2108	1983	2538	2007
PS810162	X94P058	-	-	....	....	....	2521	1993
CDC-Verdi	-------	-	-	....	....	....	2453	1980
PRO-98106	-------	-	-	....	....	....	2534	1964
PS9910346	X93P123	-	-	....	....	....	....	1955
Lifter	X93P045	+	-	2844	2214	1983	2381	1938
PS9910592	X95P122	-	-	....	....	....	....	1928
Ariel	-------	-	-	2818	1859	1476	2462	1911
PS710048	X92P202	-	-	....	....	1513	2634	1910
Joel	X84F172	+	+	2443	2072	1650	2375	1908
Cruiser	-------	-	-	....	....	1527	2518	1890
PS9910079	X95P118	+	-	....	....	....	....	1873
PS9910484	X94P081	-	-	....	....	....	....	1873
PS610324	X93P192	-	-	....	....	1531	2138	1837
CDC-Montero	-------	-	-	....	....	....	2406	1824
Columbian	-------	+	+	2127	1869	1449	2345	1809
CEB-1170	-------	-	-	....	2093	1504	2530	1755
Franklin	X93P046	+	-	2763	1988	1686	2049	1733
Columbian(Lot I)	-------	+	+	....	....	....	....	1728
CMG-1002	-------	+	+	....	....	....	....	1708
Toledo	--------	-	-	2384	1639	1623	2559	1644
CMG-1003	-------	+	-	....	....	....	....	1439
Grand Mean				2583	1937	1646	2477	1850
LSD $_{(\alpha=0.05)}$				238	177	152	152	159

Leaf type; + =normal leaf, - =*afila* or semileafless type.
Plant type; + =tall plant type, - =short plant type.
Yield data are means of three replications at each location, over four locations.

Table 5. Agronomic Data from the Preliminary Green Dry Pea Yield Trial, 2002 (0203)

Cultivar	Origin	Leaf Type	Plant Type	% Bleach	% Hard Seed	Disease Fw	Disease PM	Disease Virus	Days to Flower	Days to Maturity	Nodes to First Flower	Pods/ Peduncle	Pod Height (green)	Pod Height (mature)	Pod Height Index	Plant Height (green)	Plant Height (mature)	Plant Height Index	Rep Nodes	Weight 100 Seed	Mean Seed Yield
													..cm..	..cm..		..cm..	..cm..			..g..	..kg/ha..
CEB-1080	-------	-	-	47	0	+	..	2	59	92	16	2	34	27	0.77	45	43	0.90	4	22.9	2578
PS0010128	X95P768	-	+	9	0	+/-	..	2	60	90	18	2	46	33	0.72	62	46	0.72	5	20.8	2439
CEB-1081	-------	-	-	14	0	+	..	2	65	94	21	2	55	39	0.68	63	51	0.83	3	24.4	2408
PS99102238	X95P768	-	-	3	0	-	..	2	63	90	18	2	55	49	0.88	66	63	0.91	3	21.5	2336
PS0010792	BX94P26-12	-	+	41	0	+	..	3	58	91	15	2	39	30	0.76	59	46	0.74	6	24.4	2296
PS0010804	BX94P64-11	-	-	16	0	+	..	4	58	89	18	2	44	36	0.83	56	47	0.82	4	21.8	2293
PS0010999	SH94-80-2-2-2	-	+	70	0	-	..	3	58	91	15	2	34	9	0.26	53	23	0.44	7	24.0	2264
PS0010902	SH95-58-1	+/-	+	20	0	+	..	4	58	89	15	2	47	24	0.50	66	44	0.70	6	23.4	2209
Toledo	-------	-	-	41	0	...			58	87	17	2	48	37	0.77	64	50	0.81	5	23.1	2150
PS00101215	SH91-119-5-1-2	-	+	79	0	+/-	+	4	58	87	16	2	45	31	0.65	65	46	0.69	5	23.3	2130
Lifter	X93P045	+	-	6	1	+			60	93	15	2	45	13	0.33	73	29	0.39	7	20.2	2100
Columbian(Lot I)	-------	+	+	17	1	+			53	89	9	2	32	15	0.48	92	28	0.34	8	19.7	2020
Joel	X84F172	+	+	88	2	+			54	90	14	2	65	11	0.16	108	28	0.28	6	20.6	2007
Columbian		+	+	19	0	+			53	91	10	2	34	15	0.46	96	34	0.35	9	19.6	1893
Grand Mean									58	90	15	2	45	26	0.59	69	14	0.64	5	22.1	2223
C.V. (%)									1	1	4		6	13	12	7	9	11	19		7
LSD $_{(\alpha=0.05)}$									1	1	1		4	5	0.1	7	5	0.10	1		218

Planting date was 4/26/2002. Harvest date was 7/30/2003.
Leaf type; + =normal leaf, - =*afila* or semileafless type.
Plant type; + =tall plant type, - = short plant type.
Fw=Fusarium wilt race 1; + =resistant, - =susceptible
PM=Powdery mildew; - =resistant, + =susceptible
Virus=Virus complex; 1 =no infection, 2 =less than 1% of plants affected, 3 =2-5% plants affected, 4 =6-10% plants affected, 5 => 10% plants affected
Pod and plant height were measured at the green pod stage and at harvest maturity.
Pod and plant indices were determined by dividing the value at harvest maturity by the green pod stage value.
Rep Nodes are total number of reproductive nodes with a pod containing seed.
Agronomic data are means of three replications at Pullman, WA.

Marrowfat Pea Trial Results

Development of marrowfat pea germplasm with large seed size and durable dark green color has been progressing rapidly. This past year 17 experimental lines were compared to three commercial check lines, ‘Maro’, ‘Guido’ and ‘Supra’ at Pullman, Fairfield and Walla Walla, WA and at Genesee, ID (Table 6). Two sister lines PS99102068 and PS9102067 were the highest yielding breeding lines and yielded approximately equal to the checks. All breeding lines had excellent seed quality and maintained moderate upright growth despite a conventional leaf type (Table 7). Significant emphasis has been placed on converting the marrowfat germplasm to a semi-leafless type to reduce lodging. The first selections of this type will be tested in large plots in 2003.

Several experimental lines have been advanced from early generation trials into the advanced yield trial for additional testing. These lines will be evaluated in large replicated trials at multiple sites during the 2003 field season. Early generation breeding material will continue to be advanced in the greenhouse and field. A greenhouse procedure similar to that used for the smooth green peas is used to select lines with dark green seed, bleach resistance and exceptionally large seed. The selected lines will be planted in the field in 2003 to select for improved seed characteristics, upright plant type and multiple disease resistance.

Table 6. Location Yield Summary (kg/ha) for the Advanced Marrowfat Dry Pea Yield Trial, 2002 (0233)

Cultivar	Origin	Leaf Type	Plant Type	Fairfield	Genesee	Pullman	Walla Walla	Mean Seed Yield
Supra	-------	-	-	1261	1767	2046	1773	1712
Guido	-------	+	-	1219	1413	2070	1851	1638
PS99102068	X95P427	+	-	1170	1719	1978	1532	1600
Maro	-------	+	-	1167	1348	1911	1782	1552
PS9102067	X95P427	+	-	887	1495	1950	1859	1548
PS99101385	X95P555	+	-	1082	1667	1800	1525	1518
PS710909	X95P017	+	-	1057	1573	1781	1639	1513
PS9101380	X95P554	+	-	1110	1305	1785	1640	1460
PS9101365	X95P554	+	-	998	1495	1758	1587	1459
PS99101381	X95P554	+	-	1074	1549	1671	1541	1459
PS99101429	X95P560	+	-	874	1556	1678	1624	1433
PS810489	X95P014	+	-	987	1699	1613	1405	1426
PS810446	X95P003	+	-	1040	1254	1674	1605	1393
PS99101364	X95P554	+	-	1004	1302	1667	1573	1386
PS99101375	X95P554	+	-	994	1544	1746	1214	1374
PS99101366	X95P554	+	-	964	1441	1584	1416	1351
PS99101362	X95P554	+	-	956	1333	1581	1393	1316
PS710904	X95P017	+	-	770	1314	1582	1372	1260
PS99101371	X95P554	+	-	851	1260	1462	1223	1199
PS99101516	X95P585	+	-	819	1104	1302	1247	1118
Grand Mean				1014	1457	1734	1540	1365
C.V. (%)				9	12	4	11	10
LSD $_{(\alpha=0.05)}$				119	240	94	240	109
Planting Date				4/29/2002	4/22/2002	4/26/2002	4/25/2002	
Harvest Date				8/20/2002	7/31/2002	7/30/2002	7/25/2002	

Leaf type; + =normal leaf, - =*afila* or semileafless type.
Plant type; + =tall plant type, - =short plant type.
Yield data are means of three replications at each location, over four locations.

Table 7. Agronomic Data for the Advanced Marrowfat Dry Pea Yield Trial, 2002 (0233)

Cultivar	Origin	Plant Ht (green) Fairfield	Plant Ht (green) Genesee	Plant Ht (green) Pullman	Plant Ht (green) Walla Walla	Mean Plant Ht (green)	Plant Ht (mature) Fairfield	Plant Ht (mature) Genesee	Plant Ht (mature) Pullman	Plant Ht (mature) Walla Walla	Mean Plant Ht (mature)	Plant Ht Index Fairfield	Plant Ht Index Genesee	Plant Ht Index Pullman	Plant Ht Index Walla Walla	Mean Plant Ht Index	Rep Nodes Fairfield	Rep Nodes Genesee	Rep Nodes Pullman	Rep Nodes Walla Walla	Mean Rep Nodes
		..cm..	..cm..	..cm..	..cm..	..cm..	..cm..	..cm..	..cm..	..cm..	..cm..										
Supra	-------	40	59	62	61	56	37	58	45	48	47	0.94	0.99	0.71	0.78	0.86	2	4	6	6	5
Guido	-------	38	46	50	58	48	31	40	35	38	36	0.83	0.86	0.70	0.67	0.77	3	3	4	5	4
PS99102068	X95P427	51	74	62	72	65	32	40	35	37	36	0.68	0.55	0.57	0.50	0.58	2	3	3	4	3
Maro	-------	37	52	55	54	50	32	44	39	35	38	0.83	0.84	0.72	0.64	0.76	2	3	4	4	3
PS9102067	X95P427	49	79	57	74	65	29	41	29	34	33	0.60	0.53	0.51	0.48	0.53	2	3	3	4	3
PS99101385	X95P555	34	36	37	53	40	26	34	29	31	30	0.76	0.88	0.75	0.60	0.75	3	3	2	3	3
PS710909	X95P017	30	42	43	59	44	20	26	19	24	22	0.71	0.62	0.45	0.40	0.55	3	3	3	5	4
PS9101380	X95P554	46	53	54	64	54	24	39	27	34	31	0.53	0.72	0.50	0.53	0.57	3	3	4	3	3
PS9101365	X95P554	42	50	53	58	51	37	43	33	33	37	0.89	0.84	0.62	0.57	0.73	3	3	4	5	4
PS99101381	X95P554	43	69	55	69	59	28	38	31	40	34	0.66	0.57	0.57	0.58	0.60	3	2	4	4	3
PS99101429	X95P560	35	45	45	57	46	30	45	40	38	38	0.82	0.95	0.89	0.68	0.84	3	3	2	4	3
PS810489	X95P014	44	53	57	71	56	21	24	23	25	23	0.50	0.45	0.40	0.36	0.43	2	2	3	4	3
PS810446	X95P003	49	65	64	73	63	23	28	28	31	28	0.50	0.43	0.42	0.42	0.44	3	4	5	4	4
PS99101364	X95P554	40	61	52	66	55	26	40	33	34	33	0.71	0.65	0.63	0.53	0.63	2	3	3	3	3
PS99101375	X95P554	41	58	59	60	55	31	36	32	35	34	0.75	0.63	0.54	0.56	0.62	3	3	4	4	4
PS99101366	X95P554	37	55	57	58	52	27	36	30	35	32	0.71	0.66	0.53	0.61	0.63	2	3	5	2	3
PS99101362	X95P554	38	53	53	64	52	30	40	33	32	34	0.83	0.75	0.64	0.51	0.68	2	3	4	3	3
PS710904	X95P017	28	40	44	53	41	25	23	21	18	22	0.88	0.56	0.49	0.33	0.57	2	3	3	4	3
PS99101371	X95P554	38	58	54	66	54	32	33	27	28	30	0.84	0.55	0.50	0.43	0.58	2	2	4	2	3
PS99101516	X95P585	44	58	51	63	54	30	40	34	39	36	0.70	0.67	0.69	0.63	0.67	2	4	3	5	4
Grand Mean		40	55	53	63	59	29	37	31	34	35	0.73	0.69	0.59	0.54	0.34	3	3	3	4	3
C.V. (%)		9	8	6	6	6	12	9	8	11	9	15	11	11	13	13	24	26	19	21	22
LSD $_{(\alpha=0.05)}$		5	6	5	5	3	5	5	3	5	3	0.15	0.10	0.10	0.10	0.07	1	1	1	1	1

Pod and plant height were measured at the green pod stage and at harvest maturity.

Plant height indices were determined by dividing the value at harvest maturity by the green pod stage value.

Rep Nodes are total number of reproductive nodes with a pod containing seed.

Agronomic data are means of three replications at each location, means are three replications over all four locations.

Table 8. Agronomic Data for the Advanced Marrowfat Dry Pea Yield Trial, 2002 (0233)

Cultivar	Origin	Disease FW	Disease PM	Disease Virus	% Bleach	% Hard Seed	Days to Flower	Days to Maturity	Nodes to First Flower	Pods/ Peduncle	Pod Height (green)	Pod Height (mature)	Pod Height Index	Weight 100 Seeds
											..cm..	..cm..		..g..
Supra	-------	+	+	4	99	0	58	90	15	2	45	33	0.78	34.1
Guido	-------	+	+	3	97	0	59	91	15	2	40	25	0.65	33.2
PS99102068	X95P427	+	..	3	28	0	59	90	17	2	50	20	0.40	29.8
Maro	-------	+	+	4	93	0	59	90	15	2	41	25	0.62	30.2
PS9102067	X95P427	+	..	3	22	0	59	90	17	2	48	17	0.33	31.1
PS99101385	X95P555	+	..	3	11	0	57	90	15	2	33	16	0.49	29.4
PS710909	X95P017	+	..	3	26	0	57	88	14	2	37	10	0.32	31.1
PS9101380	X95P554	+	..	3	15	0	56	90	14	2	38	13	0.34	30.0
PS9101365	X95P554	+	..	3	13	0	56	91	13	2	40	20	0.48	32.1
PS99101381	X95P554	+	..	3	20	0	55	91	16	2	40	15	0.33	32.6
PS99101429	X95P560	+	..	3	29	0	57	91	14	2	36	23	0.62	30.4
PS810489	X95P014	+	..	4	33	0	58	89	13	2	43	8	0.20	27.7
PS810446	X95P003	+	..	3	40	0	57	89	15	2	47	14	0.29	28.7
PS99101364	X95P554	+	..	2	17	0	56	91	16	2	44	21	0.49	32.7
PS99101375	X95P554	+	..	3	18	0	55	91	14	2	46	18	0.44	30.8
PS99101366	X95P554	+	..	3	20	0	56	91	15	2	42	16	0.35	32.0
PS99101362	X95P554	+	..	3	9	0	56	91	15	2	39	20	0.51	30.6
PS710904	X95P017	+	..	3	25	0	59	90	15	2	37	13	0.33	27.9
PS99101371	X95P554	+	..	4	20	0	55	91	14	2	41	12	0.27	31.5
PS99101516	X95P585	+	..	3	15	0	56	93	14	2	43	20	0.54	30.1
Grand Mean							57	90	15	2	42	18	0.44	30.8
C.V. (%)							1	1	4		7	13	18	
LSD $_{(\alpha=0.05)}$							1	1	1		4	3	0.10	

Pod height was measured at the green pod stage and at harvest maturity.

Pod height indices were determined by dividing the value at harvest maturity by the green pod stage value.

Fw=Fusarium wilt race 1; + =resistant, - =susceptible

PM=Powdery mildew; - =resistant, + =susceptible

Virus=Virus complex; 1 =no infection, 2 =less than 1% of plants affected, 3 =2-5% plants affected, 4 =6-10% plants affected, 5 => 10% plants affected

Yield data are means of three replications at Pullman, WA.

Table 9. Mean Yields (kg/ha) from Advanced Marrowfat Dry Pea Yield Trial 1998-2002

Cultivar	Origin	Leaf Type	Plant Type	1998	1999	2000	2001	2002
Supra	-------	-	-	2071	1808	1326	2074	1712
Guido	-------	+	-	....	....	1358	2192	1638
PS99102068	X95P427	+	-	....	....	....	....	1600
Maro	-------	+	-	2060	1982	1341	2076	1552
PS9102067	X95P427	+	-	....	....	....	2067	1548
PS99101385	X95P555	+	-	....	....	....	....	1518
PS710909	X95P017	+	-	....	....	1396	1614	1513
PS9101380	X95P554	+	-	....	....	....	1742	1460
PS9101365	X95P554	+	-	....	....	....	1611	1459
PS99101381	X95P554	+	-	....	....	....	....	1459
PS99101429	X95P560	+	-	....	....	....	....	1433
PS810489	X95P014	+	-	....	....	....	1731	1426
PS810446	X95P003	+	-	....	....	....	1810	1393
PS99101364	X95P554	+	-	....	....	....	....	1386
PS99101375	X95P554	+	-	....	....	....	....	1374
PS99101366	X95P554	+	-	....	....	....	....	1351
PS99101362	X95P554	+	-	....	....	....	....	1316
PS710904	X95P017	+	-	....	....	1396	1614	1260
PS99101371	X95P554	+	-	....	....	....	....	1199
PS99101516	X95P585	+	-	....	....	....	....	1118
Grand Mean				2138	1858	1376	1864	1365
LSD $_{(\alpha=0.05)}$				179	172	111	109	109

Leaf type; + =normal leaf, - =*afila* or semileafless type.
Plant type; + =tall plant type, - =short plant type.
Yield data are means of three replications at each location, over four locations.

Table 10. Agronomic Data from the Preliminary Yellow and Marrowfat Dry Pea Yield Trial, 2002 (0204)

Cultivar	Origin	Leaf Type	Plant Type	Disease Fw	Disease PM	Disease Virus	% Bleach	% Hard Seed	Days to Flower	Days to Maturity	Nodes to First Flower	Pods/ Peduncle	Pod Height (green)	Pod Height (mature)	Pod Height Index	Plant Height (green)	Plant Height (mature)	Plant Height Index	Rep Nodes	Weight 100 Seed	Mean Seed Yield
													..cm..	..cm..		..cm..	..cm..			..g..	..kg/ha..
											Marrowfats										
Big-Daddy	-------	-	-	+	+	4	100	0	57	91	14	2	36	28	0.77	59	43	0.76	5	35.7	2114
CEB-2027	-------	-	-	+	..	4	100	0	60	92	16	2	37	30	0.78	53	42	0.84	4	30.0	2030
Maro	-------	+	-	+	+	4	95	0	59	92	14	2	36	19	0.54	48	34	0.72	3	28.9	1965
Supra	-------	-	-	+	+	4	99	0	58	92	15	2	37	33	0.9	53	48	0.85	6	32.7	1945
PS0010496	X95P473	+	-	+	..	3	5	0	57	89	13	2	36	18	0.46	42	25	0.62	4	28.0	1893
Guido	-------	+	-	+	+	3	99	0	59	92	15	2	37	24	0.66	50	36	0.70	5	33.4	1877
PS0010495	X95P473	+	-	+	..	3	29	0	57	89	14	2	33	22	0.63	45	29	0.65	4	29.0	1828
PS0010554	X95P590	+	-	+	..	4	18	0	57	88	14	2	37	12	0.32	48	24	0.48	4	32.4	1753
PS0010408	X95P272	+	-	+	..	5	9	0	55	89	15	2	41	20	0.47	52	31	0.64	3	33.6	1587
PS0010545	X95P554	+	-	+	..	4	12	0	55	90	15	2	39	25	0.65	51	34	0.65	4	32.0	1577
PS00101734	X96P109	+	-	+	..	4	27	0	56	89	13	2	30	9	0.27	41	21	0.56	4	28.3	1483
				Sub Mean – Marrowfat Type					57	90	14	2	36	22	0.59	49	33	0.68	4	31.3	1823
											Yellow Cots										
Delta	-------	-	-	+	..	4			58	88	17	2	46	42	0.91	59	50	0.85	4	21.5	2411
PS0010836	SH95-6-1	-	-	+	..	4			59	89	16	2	39	29	0.77	50	42	0.83	4	24.6	2384
Fallon	X87F061	-	-	+	..	3			57	88	15	2	40	16	0.42	56	27	0.48	5	22.1	2347
PS0010993	SH94-77-2-4-4	-	-	+	..	3			59	88	18	2	42	32	0.78	49	45	0.87	3	21.5	2263
PS0010806	X94P81-2	-	-	+	..	3			59	91	15	2	31	20	0.65	55	37	0.67	7	26.7	2184
PS0010946	SH94-37-2-6-4	-	-	+	..	4			57	89	15	2	46	33	0.73	71	56	0.80	5	23.0	2157
PS0010805	X94P81-2	-	-	+	..	4			59	91	14	2	29	10	0.38	52	27	0.49	6	25.9	2135
Shawnee	X84F259	+	+	+	..	3			55	88	15	2	54	9	0.18	86	23	0.27	5	21.4	1965
PS0010817	X92P33-3	+	-	-	..	3			60	92	18	2	50	34	0.66	71	52	0.75	5	30.1	1889
				Sub Mean – Yellow Cot Type					58	89	16	2	42	25	0.61	61	40	0.67	5	24.1	2193
Grand Mean									58	90	15	2	39	23	0.60	55	36	0.67	5	28.0	1989

Planting date was 4/26/2002. Harvest date was 7/30/2003.

Leaf type; + =normal leaf, - =*afila* or semileafless type. Plant type; + =tall plant type, - = short plant type.

Fw=Fusarium wilt race 1; + =resistant, - =susceptible. PM=Powdery mildew; - =resistant, + =susceptible. Virus=Virus complex; 1 =no infection, 2 =less than 1% of plants affected, 3 =2-5% plants affected, 4 =6-10% plants affected, 5 => 10% plants affected

Pod and plant height were measured at the green pod stage and at harvest maturity. Pod and plant indices were determined by dividing the value at harvest maturity by the green pod stage value.

Rep Nodes are total number of reproductive nodes with a pod containing seed.

Agronomic data are means of three replications at Pullman, WA.

Yellow Pea Trial Results

The advanced yellow pea yield trial was grown at Pullman, Fairfield and Walla Walla, WA, and at Genesee, ID (Table 11). The trial contained six experimental lines and 14 checks. Several lines new to the trial were among the highest yielding entries. PS9910134 and PS9910135 were the highest yielding lines producing 2292 and 2272 kg/ha, respectively, and will continue to be evaluated.

We have accomplished the objective of converting the yellow pea breeding lines to the semi-leafless and semi-dwarf plant type which has improved standing ability. Plant height index among the breeding lines ranged from 0.41 to 0.70 and averaged 0.54. This is a significant improvement over previous years (Table 12). Continued selection for upright growth promises to identify lines with greater standing ability. Breeding lines exhibiting upright growth will be yield tested in the coming years.

Table 11. Location Yield Summary (kg/ha) for the Advanced Yellow Dry Pea Yield Trial, 2002 (0202)

Cultivar	Origin	Leaf Type	Plant Type	Fairfield	Genesee	Pullman	Walla Walla	Mean Seed Yield
CEB-1489	-------	-	-	2078	2663	2491	2278	2377
PS9910188	X94P161	-	-	2184	2498	2534	2275	2373
PS9910140	X92P303	-	-	2090	2348	2559	2181	2295
PS9910134	X92P303	-	-	2240	2085	2551	2291	2292
PS9910135	X92P303	-	-	1959	2335	2512	2283	2272
Universal	-------	-	-	2306	2650	2415	1624	2249
Badminton	-------	-	-	2155	2200	2466	2172	2248
Midas	-------	-	-	2225	2026	2397	2226	2218
Eiffel	-------	-	-	2025	2182	2441	2208	2214
CDC-Mozart	-------	-	-	1987	2135	2411	2097	2158
Delta	-------	-	-	2011	2121	2113	2270	2129
Fallon	X87F061	-	-	1955	2080	2420	1854	2077
CEB-1484	-------	-	-	1983	2025	2159	2127	2073
PS810765	X94P161	-	-	2012	2100	2402	1727	2060
CDC-Handel	-------	-	-	1894	2173	2354	1785	2051
Swing	-------	-	-	1848	2056	2119	2058	2020
Rex	-------	+	-	1888	2195	2279	1718	2020
PS7101149	X92P226	+	-	2170	1933	2365	1590	2014
Shawnee	X84F259	+	+	1940	1920	2054	1627	1885
CDC-Minuet	-------	-	-	1714	1855	2236	1705	1878
Grand Mean				2033	2179	2364	2005	2048
C.V. (%)				5	8	5	7	7
LSD $_{(\alpha=0.05)}$				149	252	156	188	112
Planting Date				4/29/2002	4/22/2002	4/26/2002	4/25/2002	
Harvest Date				8/20/2002	8/7/2002	7/30/2002	7/25/2002	

Leaf type; + =normal leaf, - =*afila* or semileafless type.
Plant type; + =tall plant type, - =short plant type.
Yield data are means of three replications at each location, over four locations.

Table 12. Agronomic Data for the Advanced Yellow Dry Pea Yield Trial, 2002 (0202)

Cultivar	Origin	Plant Ht (green) Fairfield	Plant Ht (green) Genesee	Plant Ht (green) Pullman	Plant Ht (green) Walla Walla	Mean Plant Ht (green)	Plant Ht (mature) Fairfield	Plant Ht (mature) Genesee	Plant Ht (mature) Pullman	Plant Ht (mature) Walla Walla	Mean Plant Ht (mature)	Plant Ht Index Fairfield	Plant Ht Index Genesee	Plant Ht Index Pullman	Plant Ht Index Walla Walla	Mean Plant Ht Index	Rep Nodes Fairfield	Rep Nodes Genesee	Rep Nodes Pullman	Rep Nodes Walla Walla	Mean Rep Nodes
		..cm..	..cm..	..cm..	..cm..	..cm..	..cm..	..cm..	..cm..	..cm..	..cm..										
CEB-1489	-------	46	60	49	61	54	33	47	36	56	43	0.72	0.81	0.77	0.94	0.81	3	3	3	4	3
PS9910188	X94P161	61	68	60	64	63	36	54	45	40	44	0.62	0.81	0.76	0.62	0.70	4	4	6	6	5
PS9910140	X92P303	51	73	57	63	61	32	33	31	38	34	0.62	0.47	0.55	0.59	0.56	4	3	5	4	4
PS9910134	X92P303	54	70	52	59	59	27	21	27	16	23	0.52	0.28	0.55	0.30	0.41	4	4	4	5	4
PS9910135	X92P303	53	69	54	66	61	28	37	26	24	29	0.53	0.52	0.47	0.34	0.47	4	5	4	5	5
Universal	-------	56	80	59	66	65	48	75	52	67	61	0.83	0.93	0.92	0.98	0.92	2	4	5	4	4
Badminton	-------	50	58	52	61	55	42	56	42	51	48	0.84	0.95	0.81	0.82	0.86	4	4	4	3	4
Midas	-------	61	66	60	74	65	55	66	60	67	62	0.89	0.98	0.95	1.00	0.96	4	3	4	4	4
Eiffel	-------	57	72	56	74	65	46	65	50	67	57	0.82	0.89	0.82	0.90	0.86	3	5	4	4	4
CDC-Mozart	-------	51	68	51	59	57	40	72	43	48	51	0.80	1.06	0.91	0.87	0.91	4	3	5	5	4
Delta	-------	54	67	54	68	61	51	65	50	58	56	0.94	0.96	0.89	0.86	0.91	4	4	3	3	4
Fallon	X87F061	60	69	60	67	64	32	43	48	35	40	0.53	0.62	0.75	0.49	0.60	4	4	4	6	5
CEB-1484	-------	58	62	55	61	59	51	58	42	58	52	0.85	0.92	0.79	0.99	0.89	4	5	5	5	5
PS810765	X94P161	51	65	58	57	58	23	24	31	31	27	0.46	0.41	0.56	0.60	0.51	4	3	4	6	4
CDC-Handel	-------	56	79	70	62	67	36	56	56	55	51	0.63	0.73	0.79	0.89	0.76	4	4	4	5	4
Swing	-------	59	74	63	72	67	51	71	49	67	60	0.86	0.95	0.78	0.94	0.88	3	4	4	4	4
Rex	-------	63	70	56	66	64	37	50	50	50	47	0.57	0.74	0.83	0.71	0.71	5	5	4	4	5
PS7101149	X92P226	58	67	60	62	62	33	35	32	38	35	0.57	0.57	0.54	0.57	0.56	4	4	5	5	5
Shawnee	X84F259	79	101	83	102	91	31	30	27	27	29	0.41	0.26	0.33	0.20	0.30	3	5	5	5	5
CDC-Minuet	-------	60	70	66	72	67	53	56	49	51	52	0.90	0.82	0.82	0.72	0.82	3	3	4	5	4
Grand Mean		57	70	59	67	59	39	51	42	47	35	0.70	0.73	0.73	0.72	0.72	4	4	4	5	4
C.V. (%)		8	6	7	8	6	9	17	7	14	9	10	15	8	16	13	21	25	19	15	23
LSD $_{(\alpha=0.05)}$		6	5	6	7	3	5	12	4	9	3	0.10	0.15	0.08	0.16	0.08	1	1	1	2	1

Pod and plant height were measured at the green pod stage and at harvest maturity.

Plant height indices were determined by dividing the value at harvest maturity by the green pod stage value.

Rep Nodes are total number of reproductive nodes with a pod containing seed.

Agronomic data are means of three replications at each location, means are three replications over all four locations.

Table 13. Agronomic Data for the Advanced Yellow Dry Pea Yield Trial, 2002 (0202)

Cultivar	Origin	Disease			Days to Flower	Days to Maturity	Nodes to First Flower	Pods/ Peduncle	Pod Height (green)	Pod Height (mature)	Pod Height Index	Weight 100 Seeds
		FW	PM	Virus					..cm..	..cm..		..g..
CEB-1489	-------	+	..	3	59	89	15	2	37	26	0.70	21.7
PS9910188	X94P161	+	..	3	59	90	16	2	41	31	0.77	25.8
PS9910140	X92P303	+	..	4	59	90	17	2	41	19	0.46	22.5
PS9910134	X92P303	+	..	3	59	89	16	2	37	14	0.38	23.2
PS9910135	X92P303	+	..	3	60	89	17	2	42	13	0.31	22.2
Universal	-------	+/-	..	3	56	88	16	2	43	39	0.91	20.6
Badminton	-------	+	+	3	59	89	16	2	39	28	0.73	21.3
Midas	-------	+	..	2	60	88	17	2	47	43	0.93	18.6
Eiffel	-------	-	..	4	56	87	16	2	48	39	0.83	24.4
CDC-Mozart	-------	+	..	3	58	89	15	2	32	30	0.93	17.9
Delta	-------	+	..	4	59	88	18	2	45	38	0.85	20.3
Fallon	X87F061	+	..	3	57	89	18	2	47	27	0.59	21.3
CEB-1484	-------	+	..	2	58	89	15	2	35	28	0.79	22.2
PS810765	X94P161	+	..	3	56	88	15	2	38	16	0.46	24.9
CDC-Handel	-------	-	..	2	59	90	18	2	49	37	0.77	19.0
Swing	-------	+	+	4	56	88	15	2	43	32	0.74	20.1
Rex	-------	-	..	4	58	89	16	2	43	31	0.73	23.8
PS7101149	X92P226	+	..	3	54	88	14	2	39	17	0.40	20.5
Shawnee	X84F259	+	..	3	54	89	14	2	54	11	0.21	22.3
CDC-Minuet	-------	-	..	2	63	91	19	2	55	35	0.60	17.9
Grand Mean					58	89	16	2	43	28	0.65	21.5
C.V. (%)					1	1	6		8	11	14	
LSD $_{(\alpha=0.05)}$					1	1	1		5	4	0.13	

Pod height was measured at the green pod stage and at harvest maturity.
Pod height indices were determined by dividing the value at harvest maturity by the green pod stage value.
Fw=Fusarium wilt race 1; + =resistant, - =susceptible
PM=Powdery mildew; - =resistant, + =susceptible
Virus=Virus complex; 1 =no infection, 2 =less than 1% of plants affected, 3 =2-5% plants affected, 4 =6-10% plants affected, 5 => 10% plants affected
Yield data are means of three replications at Pullman, WA.

Table 14. Mean Yields (kg/ha) from Advanced Yellow Dry Pea Yield Trial 1998-2002

Cultivar	Origin	Leaf Type	Plant Type	1998	1999	2000	2001	2002
PS9910134	X92P303	-	-	....	....	....	....	2377
PS9910135	X92P303	-	-	....	....	....	....	2373
CEB-1489	-------	-	-	....	....	....	3164	2295
PS9910188	X94P161	-	-	....	....	....	....	2292
Delta	-------	-	-	2571	2181	1322	2870	2272
Midas	-------	-	-	....	....	....	....	2249
Eiffel	-------	-	-	....	....	....	....	2248
PS9910140	X92P303	-	-	....	....	....	....	2218
Badminton	-------	-	-	3084	2287	1694	3000	2214
CEB-1484	-------	-	-	....	....	....	2905	2158
CDC-Mozart	-------	-	-	....	....	1989	2876	2129
Swing	-------	-	-	2534	1922	1529	2789	2077
Fallon	X87F061	-	-	3058	2432	1758	2807	2073
CDC-Handel	-------	-	-	....	....	1753	2652	2060
PS810765	X94P161	-	-	....	....	....	2871	2051
Rex	-------	+	-	2508	2026	1487	2740	2020
CDC-Minuet	-------	-	-	....	....	....	2409	2020
Shawnee	X84F259	+	+	2462	2040	1538	2488	2014
Universal	--------	-	-	....	....	....	....	1885
PS7101149	X92P226	+	-	....	....	1692	2716	1878
Grand Mean				2610	2142	1605	2754	2048
LSD $_{(\alpha=0.05)}$				206	203	159	179	112

Leaf type; + =normal leaf, - =*afila* or semileafless type.
Plant type; + =tall plant type, - =short plant type.
Yield data are means of three replications at each location, over four locations.

Table 15. Agronomic Data from the Preliminary Green, Yellow and Marrowfat Dry Pea Observation Trial, 2002 (0205)

Cultivar	Origin	% Bleach	% Hard Seed	Leaf Type	Plant Type	Days to Flower	Days to Maturity	Nodes to First Flower	Pods/ Peduncle	Pod Height (green)	Pod Height (mature)	Pod Height Index	Plant Height (green)	Plant Height (mature)	Plant Height Index	Rep Nodes	Weight 100 Seed	Mean Seed Yield
										..cm..	..cm..		..cm..	..cm..			..g..	..kg/ha..
								Green Cots										
PS0110537	BX96P32-13	20	0	+	-	57	90	15	2	42	30	0.71	70	47	0.67	5	24.4	2819
PS0110538	BX96P32-13	19	0	+	-	57	90	16	2	48	31	0.65	73	47	0.64	6	25.6	2694
PS01102902	X95P768	15	0	+	-	62	91	15	2	47	41	0.87	60	54	0.90	4	20.4	2584
PS0110682	X98P010	6	1	-	-	59	90	14	2	37	32	0.86	55	46	0.84	6	20.9	2573
PS0110539	BX96P32-13	16	0	+	-	59	89	15	2	37	30	0.81	52	44	0.85	5	25.7	2545
PS0110354	BX97P18-41	--	--	+	-	57	93	13	2	36	24	0.67	50	37	0.74	5	29.2	2533
PS0110745	X98P020	30	3	-	-	56	86	16	2	38	34	0.89	51	47	0.92	5	19.1	2487
PS01102889	X94P011	11	0	-	-	52	91	12	2	24	33	1.38	70	59	0.84	8	21.9	2466
PS0110060	BX97P16	28	1	-	-	59	88	18	2	43	35	0.81	49	43	0.88	3	20.1	2449
PS0110183	BXM94P33-1	48	0	+	-	58	87	15	2	30	29	0.97	40	32	0.80	3	20.5	2417
PS0110461	BX97P9-6	35	0	-	-	58	88	15	2	31	29	0.94	52	41	0.79	5	23.5	2415
PS0110785	X98P024	4	0	-	-	56	86	18	2	30	29	0.97	44	46	1.05	3	17.2	2414
PS01102901	X95P768	13	0	+	-	59	89	16	2	39	33	0.85	50	45	0.90	3	22.1	2413
PS0110926	X98P192	27	1	-	-	60	89	17	2	44	36	0.82	56	45	0.80	3	17.3	2410
PS0110459	BX97P9-6	28	0	-	-	59	87	13	2	32	31	0.97	40	41	1.03	3	17.3	2393
PS0110161	BXM95P50-2	38	0	+	-	57	90	15	2	45	37	0.82	68	55	0.81	4	25.0	2391
PS01101467	X98P131	19	1	+	-	59	91	15	2	36	25	0.69	61	42	0.69	4	21.8	2365
PS0110677	X98P007	19	0	-	-	53	84	14	2	41	33	0.80	59	45	0.76	4	20.2	2359
PS01101386	X98P112	3	0	-	-	60	91	13	2	35	20	0.57	54	40	0.74	4	25.7	2328
PS0110947	X98P197	17	4	-	-	60	89	18	2	45	33	0.73	54	49	0.91	3	19.1	2323
PS0110756	X98P021	24	0	-	-	60	90	19	2	43	39	0.91	60	53	0.88	5	19.4	2318
PS0110851	X98P032	22	1	-	-	59	87	15	2	35	37	1.06	43	46	1.07	3	15.6	2315
PS0110536	BX97P32-29	26	0	-	-	60	90	13	2	27	27	1.00	43	39	0.91	4	22.8	2312
PS0110375	BX96P17-47	26	0	-	-	55	87	13	2	24	19	0.79	46	35	0.76	6	25.2	2308
PS0110778	X98P023	21	0	-	-	56	86	17	2	46	34	0.74	60	51	0.85	3	19.3	2297
PS0110194	BX94P61-12	27	0	-	-	58	89	17	2	45	24	0.53	67	44	0.66	5	23.1	2292
PS0110767	X98P022	8	1	-	-	57	87	18	2	40	40	1.00	61	53	0.87	7	20.5	2287
PS0110950	X98P197	27	0	-	-	59	89	15	2	33	29	0.88	52	42	0.81	4	19.0	2280

Table 15. Agronomic Data from the Preliminary Green, Yellow and Marrowfat Dry Pea Observation Trial, 2002 (0205) Continued

Cultivar	Origin	% Bleach	% Hard Seed	Leaf Type	Plant Type	Days to Flower	Days to Maturity	Nodes to First Flower	Pods/ Peduncle	Pod Height (green)	Pod Height (mature)	Pod Height Index	Plant Height (green)	Plant Height (mature)	Plant Height Index	Rep Nodes	Weight 100 Seed	Mean Seed Yield
										..cm..	..cm..		..cm..	..cm..			..g..	..kg/ha..
Columbian	-------	11	2	+	+	51	89	8	2	30	14	0.47	76	34	0.45	11	19.2	2268
PS0110062	BX97P16	18	1	-	-	59	91	16	2	51	23	0.45	74	42	0.57	5	20.4	2266
PS0110755	X98P021	10	1	-	-	55	87	16	2	32	28	0.88	51	43	0.84	6	21.5	2264
PS0110796	X98P024	15	0	-	-	58	87	18	2	45	41	0.91	60	51	0.85	2	18.3	2263
PS0110158	BXM95P47-2	30	0	-	-	57	87	16	2	59	30	0.51	66	51	0.77	3	21.2	2258
PS0110864	X98P035	13	2	-	-	59	89	15	2	37	32	0.86	50	42	0.84	4	19.8	2255
PS0110184	BXM94P33-1	71	0	+	-	59	89	15	2	28	26	0.93	38	37	0.97	4	22.0	2253
PS0110923	X98P179	38	1	-	-	55	86	14	2	28	22	0.79	41	33	0.80	4	18.7	2251
PS0110932	X98P194	22	0	-	-	58	87	16	2	45	27	0.60	57	43	0.75	3	21.9	2248
PS0110797	X98P024	17	0	-	-	59	87	16	2	42	47	1.12	56	59	1.05	2	18.3	2238
PS0110460	BX97P9-6	22	0	-	-	59	89	14	2	32	26	0.81	44	42	0.95	3	23.0	2235
PS0110777	X98P023	16	1	-	-	57	86	16	2	40	32	0.80	49	44	0.90	3	19.3	2201
PS0110805	X98P025	18	0	-	-	60	91	19	2	54	43	0.80	76	60	0.79	6	20.0	2192
PS0110762	X98P021	22	0	-	-	59	88	19	2	50	34	0.68	64	48	0.75	5	19.5	2190
PS0110786	X98P024	10	0	-	-	59	86	17	2	50	34	0.68	60	52	0.87	3	19.5	2174
PS0110753	X98P021	3	0	-	-	60	87	18	2	50	46	0.92	60	61	1.02	3	18.4	2172
PS0110812	X98P025	23	0	-	-	59	89	18	2	50	40	0.80	71	52	0.73	4	19.1	2170
PS0110904	X98P041	17	1	-	-	56	86	15	2	34	36	1.06	50	45	0.90	3	18.8	2150
Lifter	X93P045	11	1	+	-	59	94	15	2	49	15	0.31	75	31	0.41	5	21.5	2146
Columbian(Lot I)	-------	12	2	+	+	51	87	6	2	28	20	0.71	50	40	0.80	5	20.5	2134
PS0110470	BX97P11-5	30	0	+	+/-	58	89	0	2	33	21	0.64	39	46	1.18	2	22.6	2132
PS0110795	X98P024	21	1	-	-	54	84	15	2	56	39	0.70	70	59	0.84	6	19.3	2125
PS0110716	X98P015	20	0	-	-	58	87	13	2	26	34	1.31	40	45	1.13	4	20.0	2112
PS0110671	X98P006	1	0	-	-	59	88	19	2	48	33	0.69	57	48	0.84	4	21.8	2077
PS0110808	X98P025	19	1	-	-	58	87	18	2	44	31	0.70	60	42	0.70	4	21.3	2073
PS0110951	X98P197	23	0	-	-	58	87	17	2	46	35	0.76	65	49	0.75	4	19.0	2069
PS0110740	X98P018	0	0	-	-	56	88	14	2	44	27	0.61	70	38	0.54	5	19.0	2061
Joel	X84F172	15	4	+	+	53	90	11	2	45	22	0.49	105	44	0.42	7	20.5	2052
PS0110830	X98P026	10	0	-	-	58	89	15	2	38	23	0.61	50	38	0.76	4	23.0	2033
PS01101478	X98P176	26	0	-	-	61	91	13	2	25	25	1.00	49	41	0.84	5	25.6	2032

Table 15. Agronomic Data from the Preliminary Green, Yellow and Marrowfat Dry Pea Observation Trial, 2002 (0205) Continued

Cultivar	Origin	% Bleach	% Hard Seed	Leaf Type	Plant Type	Days to Flower	Days to Maturity	Nodes to First Flower	Pods/ Peduncle	Pod Height (green)	Pod Height (mature)	Pod Height Index	Plant Height (green)	Plant Height (mature)	Plant Height Index	Rep Nodes	Weight 100 Seed	Mean Seed Yield
										..cm..	..cm..		..cm..	..cm..			..g..	..kg/ha..
PS0110807	X98P025	6	0	-	-	59	89	17	2	53	37	0.70	70	52	0.74	5	19.4	2024
PS0110827	X98P026	18	0	-	-	59	89	18	2	65	42	0.65	73	53	0.73	5	21.2	2024
PS0110765	X98P021	30	0	-	-	56	87	14	2	39	32	0.82	61	47	0.77	8	18.6	2022
PS0110816	X98P025	27	0	-	-	59	89	15	2	58	40	0.69	70	54	0.77	4	20.6	1950
PS0110027	BX97P5-1	51	0	+	-	59	93	14	2	33	14	0.42	52	33	0.63	5	25.4	1922
PS0110811	X98P025	27	0	-	-	59	88	20	2	46	43	0.93	62	52	0.84	4	21.3	1903
PS0110815	X98P025	18	0	-	-	60	89	14	2	32	33	1.03	51	48	0.94	6	18.0	1898
PS0110159	BXM95P47-2	41	0	+/-	-	59	90	16	2	57	34	0.60	76	52	0.68	5	22.7	1851
PS0110799	X98P024	11	0	-	-	59	88	19	2	42	33	0.79	60	46	0.77	6	19.3	1845
PS0110965	X98P004	23	1	-	-	59	87	17	2	42	30	0.71	50	45	0.90	3	19.1	1788
PS0110201	BX94P76-17	41	0	+	-	59	92	13	2	31	23	0.74	52	43	0.83	5	24.9	1776
PS0110168	BXM95P60-2	34	0	+	-	56	89	15	2	40	34	0.85	62	46	0.74	6	26.5	1697
PS01101481	X98P176	59	0	-	-	59	89	15	2	30	19	0.63	44	32	0.73	4	23.0	1482
PS01101482	X98P176	13	0	-	-	61	92	13	2	26	19	0.73	53	37	0.70	6	25.5	1445
PS0110793	X98P024	17	0	-	-	55	83	13	2	36	30	0.83	55	49	0.89	5	17.9	1396
PS0110164	BXM95P54-2	10	0	+	+	59	90	17	2	65	20	0.31	99	40	0.40	6	23.7	1391
PS0110048	BX97P11-3	5	0	+	+	59	91	15	2	62	13	0.21	105	39	0.37	7	25.6	867
	Sub Mean - Green Cot Types					58	89	15	2	41	30	0.77	59	45	0.80	5	21.2	2162
								Marrowfats										
PS01101063	X95P055	86	0	+	-	56	88	16	2	38	17	0.45	43	29	0.67	3	32.4	1940
Guido	-------	100	0	+	-	59	93	15	2	35	31	0.89	48	44	0.92	3	34.5	1883
PS01101174	X95P065	37	0	+	-	54	89	14	2	38	17	0.45	50	32	0.64	5	33.4	1762
Maro	-------	27	0	+	-	59	93	17	2	43	26	0.60	50	41	0.82	5	30.3	1731
Supra	-------	99	0	-	-	59	92	15	2	39	32	0.82	58	50	0.86	5	33.9	1730
PS01101287	X95P555	82	1	+	-	56	88	15	2	38	17	0.45	48	26	0.54	4	31.5	1715
PS01102929	X95P014	59	0	+	-	54	87	15	2	38	21	0.55	46	30	0.65	5	33.7	1696
PS01101184	X95P329	23	0	+	-	59	92	14	2	34	16	0.47	45	27	0.60	5	35.2	1631
PS01101218	X95P440	20	0	+	-	56	91	14	2	29	16	0.55	43	28	0.65	5	32.3	1616
PS01101209	X95P439	30	0	+	-	55	89	15	2	40	13	0.33	60	35	0.58	6	33.2	1497

Table 15. Agronomic Data from the Preliminary Green, Yellow and Marrowfat Dry Pea Observation Trial, 2002 (0205) Continued

Cultivar	Origin	% Bleach	% Hard Seed	Leaf Type	Plant Type	Days to Flower	Days to Maturity	Nodes to First Flower	Pods/ Peduncle	Pod Height (green)	Pod Height (mature)	Pod Height Index	Plant Height (green)	Plant Height (mature)	Plant Height Index	Rep Nodes	Weight 100 Seed	Mean Seed Yield
										..cm..	..cm..		..cm..	..cm..			..g..	..kg/ha..
PS01101328	X95P590	25	0	+	-	55	90	14	2	42	11	0.26	62	27	0.44	6	31.2	1395
PS01102924	X95P005	73	0	+	-	59	89	16	2	33	19	0.58	38	26	0.68	3	30.3	1351
PS01101290	X95P555	36	0	+	-	59	89	15	2	43	12	0.28	51	26	0.51	4	31.0	1011
Sub Mean – Marrowfat Types						57	90	15	2	38	19	0.51	49	32	0.66	5	32.5	1612
								Yellow Cots										
PS0110665	BX92P125-2	--	--	+	-	56	85	15	2	40	27	0.68	48	38	0.79	3	23.1	2597
PS0110519	BX97P2-67	--	--	-	-	56	87	16	2	45	36	0.80	53	52	0.98	3	18.8	2591
PS0110135	BXM95P18-1	--	--	-	-	56	86	15	2	52	24	0.46	61	44	0.72	4	20.5	2582
PS0110487	BX97P12-14	--	--	+	-	56	87	12	2	43	25	0.58	51	39	0.76	3	17.7	2543
PS0110131	BXM95P13-4	--	--	-	-	54	87	16	2	37	25	0.68	45	42	0.93	3	27.1	2435
PS01102958	X96P124	--	--	-	-	59	88	16	2	43	29	0.67	59	42	0.71	4	22.2	2404
PS0110664	BX92P125-2	--	--	+	-	56	85	13	2	35	27	0.77	47	32	0.68	2	23.1	2401
PS0110605	BX97P31-12	--	--	+	-	58	87	16	2	47	31	0.66	62	47	0.76	5	18.4	2377
PS0110637	BX97P39-13	--	--	+	-	56	89	12	2	36	24	0.67	49	40	0.82	5	26.8	2332
PS0110051	BX97P13-1	--	--	+	-	56	85	15	2	40	28	0.70	59	45	0.76	5	21.8	2302
PS0110181	BXM94P18-3	--	--	-	-	58	88	15	2	34	26	0.76	46	41	0.89	4	22.1	2295
PS0110612	BX96P31-13	--	--	-	-	56	87	16	2	49	48	0.98	60	58	0.97	3	21.9	2295
PS0110663	BX94P88-47	--	--	-	-	56	87	17	2	68	38	0.56	94	51	0.54	4	21.4	2291
PS0110454	BX98P10-7	--	--	+	-	56	88	14	2	38	16	0.42	53	33	0.62	4	23.0	2287
PS0110516	BX97P2-67	--	--	-	-	56	87	15	2	38	37	0.97	57	49	0.86	4	17.8	2266
PS0110187	BX94P37-26	--	--	+	-	56	90	15	2	44	24	0.55	66	43	0.65	6	22.3	2260
PS0110140	BXM95P23-3	--	--	+	-	56	89	15	2	33	20	0.61	43	34	0.79	4	26.4	2259
PS0110125	BXM95P9-72	--	--	-	-	59	88	16	2	45	36	0.80	53	46	0.87	3	25.0	2245
PS0110141	BXM95P24-1	--	--	-	-	58	89	16	2	33	24	0.73	41	36	0.88	3	23.4	2239
PS01102950	X94P161	--	--	-	-	54	85	16	2	46	31	0.67	56	45	0.80	5	23.1	2209
Fallon	X87F061	--	--	-	-	56	87	16	2	47	27	0.57	59	36	0.61	6	22.0	2203
PS01102951	X94P161	--	--	-	-	54	86	13	2	41	36	0.88	52	53	1.02	2	23.4	2178
PS0110596	BX98P30-2	--	--	+	-	54	87	16	2	50	17	0.34	61	36	0.59	4	18.5	2169
PS0110595	BX98P30-2	--	--	+	-	55	87	16	2	43	25	0.58	56	39	0.70	4	19.7	2151

Table 15. Agronomic Data from the Preliminary Green, Yellow and Marrowfat Dry Pea Observation Trial, 2002 (0205) Continued

Cultivar	Origin	% Bleach	% Hard Seed	Leaf Type	Plant Type	Days to Flower	Days to Maturity	Nodes to First Flower	Pods/ Peduncle	Pod Height (green)	Pod Height (mature)	Pod Height Index	Plant Height (green)	Plant Height (mature)	Plant Height Index	Rep Nodes	Weight 100 Seed	Mean Seed Yield
										..cm..	..cm..		..cm..	..cm..			..g..	..kg/ha..
Delta	-------	--	--	-	-	57	86	18	2	47	38	0.81	55	49	0.89	3	19.6	2124
PS0110123	BXM95P9-21	--	--	-	-	56	88	15	2	46	33	0.72	63	37	0.59	4	25.4	2119
PS01101501	X98P088	--	--	-	-	63	90	15	2	39	37	0.95	52	51	0.98	4	20.8	1976
PS01103430	X96P138	--	--	-	-	63	92	17	2	45	39	0.87	53	52	0.98	3	25.3	1933
Shawnee	X84F259	--	--	+	+	53	87	14	2	51	17	0.33	80	29	0.36	3	22.5	1872
PS0110611	BX96P31-13	--	--	-	-	55	87	17	2	51	39	0.76	64	51	0.80	5	21.6	1742
PS01103450	X99P005	--	--	-	-	59	93	15	2	37	23	0.62	55	38	0.69	5	28.6	1510
PS0110050	BX97P13-1	--	--	+	-	56	85	15	2	31	22	0.71	42	34	0.81	3	21.6	....
Sub Mean – Yellow Cot Types						57	87	15	2	43	29	0.68	56	43	0.78	4	22.3	2232

Cultivar	Origin	Disease PM	Disease Virus	% Bleach	% Hard Seed	Leaf Type	Plant Type	Days to Flower	Days to Maturity	Nodes to First Flower	Pods/ Peduncle	Pod Height (green)	Pod Height (mature)	Pod Height Index	Plant Height (green)	Plant Height (mature)	Plant Height Index	Rep Nodes	Weight 100 Seed	Mean Seed Yield
												..cm..	..cm..		..cm..	..cm..			..g..	..kg/ha..
Parentals																				
M40	-------	..	3	10	0	+	-	58	89	13	2	31	12	0.39	42	25	0.60	5	24.1	2236
Orgor(K8239)	-------	..	4	22	0	+	+	55	87	15	2	57	15	0.26	67	31	0.46	3	20.5	2180
Ramonskii-85 (K8124)	-------	+	4	--	--	+	+	55	87	15	2	59	19	0.32	72	32	0.44	3	24.2	2108
Ran/Frezchen it /(K7609)	-------	+	5	--	--	+	+	55	87	15	2	55	17	0.31	78	37	0.47	2	22.3	2066
Paris/CSM85/ (K7821)	-------	..	5	100	6	+	+	52	84	14	2	68	9	0.13	91	29	0.32	5	18.6	1994
Belkovaya-Grizd (K8195)	-------	..	..	--	--	+	+	55	86	14	3	52	18	0.35	75	30	0.40	3	19.5	1982
Friplex (K6936)	-------	+	4	--	--	+	-	54	83	16	2	41	4	0.10	52	15	0.29	4	17.6	1937
No-140 (K5455)	-------	+	4	95	9	+	-	56	87	13	2	35	21	0.60	43	34	0.79	3	33.0	1898
Mira(K8271)	-------	+	4	78	5	+	-	59	87	16	2	44	7	0.16	53	20	0.38	2	14.3	1877

Table 15. Agronomic Data from the Preliminary Green, Yellow and Marrowfat Dry Pea Observation Trial, 2002 (0205) Continued

Cultivar	Origin	Disease PM	Disease Virus	% Bleach	% Hard Seed	Leaf Type	Plant Type	Days to Flower	Days to Maturity	Nodes to First Flower	Pods/ Peduncle	Pod Height (green)	Pod Height (mature)	Pod Height Index	Plant Height (green)	Plant Height (mature)	Plant Height Index	Rep Nodes	Weight 100 Seed	Mean Seed Yield
												..cm..	..cm..		..cm..	..cm..			..g..	..kg/ha..
Salome (K7899)	-------	+	4	--	--	+	+	52	87	11	2	36	20	0.56	73	33	0.45	5	25.2	1798
Helia(K8454)	-------	..	4	--	--	+	+	60	89	18	2	80	22	0.28	101	40	0.40	3	18.7	1790
Flagman (K8192)	-------	+	4	--	--	+	-	54	87	13	2	41	16	0.39	52	31	0.60	3	23.5	1761
Celep (K8290)	-------	+	4	--	--	-	-	58	88	18	2	45	34	0.76	61	51	0.84	5	25.0	1733
Maple (KG115)	-------	+	4	--	--	+	+	62	93	15	2	60	21	0.35	98	41	0.42	4	16.6	1675
Krevash (K8447)	-------	+	3	--	--	+	+	59	89	17	2	76	15	0.20	91	29	0.32	2	20.1	1640
GUR-II (K7565)	-------	..	..	--	1	+	+	60	89	19	2	77	18	0.23	109	38	0.35	4	17.1	1463
MIR-12 (K8529)	-------	+	4	--	2	+	+	63	94	18	2	64	16	0.25	82	35	0.43	2	15.0	1411
Fidelia (K8453)	-------	+	4	--	8	+	+	57	87	14	2	59	17	0.29	84	38	0.45	3	17.2	1235
Eroica(K6285)	-------	+	4	--	0	+	-	54	93	8	2	16	20	1.25	41	39	0.95	7	42.1	1032
Sub Mean – Parental Types								57	88	15	2	52	17	0.38	72	33	0.49	4	21.8	1780
Grand Mean								57	88	15	2	43	27	0.67	59	42	0.74	4	22.6	2058

Planting date was 4/26/2002. Harvest date was 7/31/3003.

Leaf type; + =normal leaf, - =*afila* or semileafless type.

Plant type; + =tall plant type, - = short plant type.

PM=Powdery mildew; - =resistant, + =susceptible

Virus=Virus complex; 1 =no infection, 2 =less than 1% of plants affected, 3 =2-5% plants affected, 4 =6-10% plants affected, 5 => 10% plants affected

Pod and plant height were measured at the green pod stage and at harvest maturity.

Pod and plant indices were determined by dividing the value at harvest maturity by the green pod stage value.

Rep Nodes are total number of reproductive nodes with a pod containing seed.

Agronomic data are means of one replication at Pullman, WA.

Table 16. Agronomic Data for the Canadian and Australian Pea Observation Nursery, 2002 (0207)

Cultivar	Leaf Type	Plant Type	Days to Flower	Days to Maturity	Nodes to First Flower	Pods/ Peduncle	Pod Height (green)	Pod Height (mature)	Pod Height Index	Plant Height (green)	Plant Height (mature)	Plant Height Index	Rep Nodes	Weight 100 Seed	Mean Seed Yield
							..cm..	..cm..		..cm..	..cm..			..g..	..kg/ha..
90-131*27-7	+	-	62	93	17	1	59	11	0.19	75	30	0.40	4	19.7	1947
Excell	-	-	57	92	16	2	45	40	0.89	51	50	0.98	3	21.1	1882
CDC-0101	-	-	64	92	20	2	44	43	0.98	45	52	1.16	1	20.0	1854
CDC-0007	-	-	63	92	21	2	47	42	0.89	57	52	0.91	4	19.6	1851
CDC-Minuet	-	-	65	92	17	2	46	41	0.89	51	48	0.94	2	16.5	1826
CDC-0102	-	-	60	91	17	2	39	31	0.79	44	38	0.86	3	18.1	1821
SB2000-2	-	-	62	93	17	2	41	37	0.90	50	46	0.92	2	19.4	1814
92-218*9*6	-	-	63	92	17	2	45	36	0.80	55	48	0.87	2	22.0	1793
92-218-*8-5	+	-	63	92	16	2	37	23	0.62	50	41	0.82	2	20.9	1766
90-158*8-5	-	-	63	92	18	2	46	42	0.91	60	52	0.87	4	22.5	1762
93-062*14	-	-	58	92	15	2	44	43	0.98	55	44	0.80	4	17.4	1749
96-288-*1	+	-	62	91	12	1	42	21	0.50	54	37	0.69	3	19.0	1735
92-254-*7-6	-	-	59	88	15	2	39	31	0.79	51	40	0.78	4	17.1	1718
95-072*3	-	+	64	98	21	2	86	27	0.31	101	43	0.43	3	21.4	1705
92-297-*10-1	-	-	62	94	15	2	41	33	0.80	52	44	0.85	3	21.3	1700
CDC-Montero	-	-	64	92	19	2	45	31	0.69	55	44	0.80	3	19.6	1668
90-166*30-5	-	-	63	94	16	2	31	28	0.90	79	47	0.59	4	22.0	1651
92-256-*1-3	-	-	60	91	16	2	45	36	0.80	56	47	0.84	3	21.2	1649
89-036-*9-8	-	-	59	89	17	2	42	26	0.62	52	44	0.85	2	18.0	1639
92-112-*1-3	-	-	60	90	15	2	39	37	0.95	46	43	0.93	3	16.7	1633
CDC-Acer	-	-	69	99	22	2	44	37	0.84	53	43	0.81	2	13.7	1620
89-036-*9-10	-	-	60	90	16	2	43	24	0.56	52	36	0.69	2	19.8	1615
92-104P5*6	-	-	57	91	17	2	40	32	0.80	45	41	0.91	3	21.0	1580
Kaspa	-	-	63	93	22	2	60	38	0.63	67	51	0.76	2	20.1	1566
CDC-0009	-	-	63	92	19	2	45	35	0.78	51	43	0.84	3	19.6	1566

Table 16. Agronomic Data for the Canadian and Australian Pea Observation Nursery, 2002 (0207) Continued

Cultivar	Leaf Type	Plant Type	Days to Flower	Days to Maturity	Nodes to First Flower	Pods/ Peduncle	Pod Height (green)	Pod Height (mature)	Pod Height Index	Plant Height (green)	Plant Height (mature)	Plant Height Index	Rep Nodes		Mean Seed Yield
							..cm..	..cm..		..cm..	..cm..				..kg/ha..
CDC-Sonata	+	-	63	96	20	2	58	20	0.34	65	31	0.48	2	25.4	1542
92-208-*12	-	-	62	95	13	2	45	39	0.87	60	50	0.83	4	18.5	1537
96-286-*1	-	-	62	96	23	2	56	28	0.50	61	42	0.69	2	21.1	1528
89-036-*9-2	-	-	62	90	18	2	51	32	0.63	52	43	0.83	6	19.5	1513
CDC-Verdi	-	-	65	92	20	2	46	41	0.89	51	52	1.02	3	18.2	1508
92-038-*9-2	-	-	60	91	15	2	46	25	0.54	56	35	0.63	4	18.6	1497
92-133-*2-9	+/-	+/-	62	94	15	2	39	16	0.41	45	34	0.76	4	18.0	1477
92-026-*5-11	-	-	65	92	16	2	39	33	0.85	47	47	1.00	3	19.5	1455
Snowpeak	-	-	58	90	16	2	44	37	0.84	62	49	0.79	4	17.4	1441
Grand Mean			62	92	17	2	46	32	0.73	56	44	0.80	3	19.5	1665

Leaf type; + =normal leaf, - =*afila* or semileafless type.

Plant type; + =tall plant type, - = short plant type.

Pod and plant height were measured at the green pod stage and at harvest maturity.

Pod and plant indices were determined by dividing the value at harvest maturity by the green pod stage value.

Agronomic data are means of one replication at Pullman, WA.

Winter Pea Trial Results:

The white-flowered, clear-seeded winter pea yield trial included 14 selections and was grown at two locations in 2002, WSU Spillman Farm and near Genesee on Russ Zenner's farm (Tables 17 and 18). All entries have yellow cotyledons with the exception of PS9530726 which has green cotyledons. Similar to spring peas the semi-leafless type is desired and has been selected in both tall and dwarf plant types. Average seed yield at Genesee was 175% of the yield at Spillman Farm and was primarily due to greater soil moisture and warmer temperatures at the Genesee site. Overall yields were approximately 20% greater in 2002 compared to 2001. PS9830S358 was the highest yielding breeding line in the trial and yielded 3844 (3420) and 2438 kg/ha (2170 lb/a) at Genesee and Spillman Farm, respectively.

Quality among the clear-seeded types was very good overall. Seed size ranged from 13.1 to 17.1 g/100 seed. Increasing the relatively small seed size remains a primary goal of the breeding program. The difficulty is based on an apparent negative genetic linkage between large seed size and high levels of winter hardiness.

Three white-flowered edible type winter peas, PS9530726, PS9530645 and PS9430706, have been tested in reduced tillage systems and in cooperative trials at several locations and produced promising results. Two lines, PS9530726 and PS9430706 were direct-seeded each of the past two years into standing cereal stubble at Rosalia, WA and Genesee, ID as part of a project funded by the Cool Season Food Legume Research Program (Tables 22 and 23). Results from the first year indicate that these types have great potential to enhance cropping systems in the Palouse.

Yield trials of Austrian winter pea selections were established at the WSU Spillman Farm near Pullman, WA (Tables 19 and 20). The advanced trial contained 4 selections and 3 checks. Due to the mild winter, there was very little winter killing in the nursery and less hardy lines could not be identified for discard. Yields averaged 2048 kg/ha (1822 lb/a) and were below average compared to previous years. Two selections were tall semi-leafless types and one was a dwarf, semi-leafless type. Selection PS9430119, a tall normal leaf type, yielded 2488 kg/ha (1481lb/a) and was 32% higher yielding compared to 'Granger'. New selections have been made for the semi-leafless trait and also for resistance to powdery mildew, Fusarium wilt and Aphanomyces root rot. Selection of Austrian winter pea types has concentrated on combining the semi-leafless trait with a tall plant type for maximum biomass production and greater avoidance of foliar disease.

Additional testing and breeding is necessary to develop improved winter pea and lentil cultivars with greater adaptation to direct seed systems. Significant progress has been made in recent years with both winter pea and lentil and through continued cooperative efforts greater advancement will be possible.

Variety Release and Potential Variety release:

A green seeded winter pea PS9530726 is being proposed for preliminary increase of Breeder seed. The selection has been seeded on about 1.5 acres in the fall of 2002 to begin the increase process. The selection has round and green seeds and could be considered as a small-sieve green pea. Yields and winter hardiness have been very good. This selection could be available to growers in the fall of 2004.

Table 17. Agronomic and Yield Data from the Advanced Clear Seed Coat Winter Pea Yield Trial, 2002 (0222F)

Cultivar	Origin	Leaf Type	Plant Type	Disease Fw	Nodes to First Flwr	Pods/ Peduncle	Pod Ht (green)	Pod Ht (mature)	Pod Ht Index	Plant Ht (green)	Plant Ht (mature)	Plant Ht Index	Weight 100 Seed	Mean Yield Pullman	Mean Yield Genesee	Seed Yield Mean
							..cm..	..cm..		..cm..	..cm..		..g..	..kg/ha..	..kg/ha..	..kg/ha..
PS9830S358	X93P060	-	-	+	17	2	35	23	0.81	63	48	1.00	14.6	2438	3844	3141
PS9830S431	X95P679	+	+	+	16	2	44	10	0.28	106	44	0.51	13.2	2465	3553	3009
PS9830F011	X92P056	-	-	+	17	2	29	27	0.85	60	52	1.00	13.5	2247	3628	2938
PS9630448	X92P056	-	+	+	19	2	64	10	0.18	103	48	0.51	14.8	1920	3926	2923
PS9830F010	X92P056	-	+	+	21	2	62	15	0.23	110	48	0.46	14.2	1660	3757	2709
PS9830F009	X92P056	-	+	+	17	2	55	10	0.15	104	45	0.46	13.5	1918	3460	2689
PS9830S329	X92P056	-	+	+	19	2	58	12	0.18	107	45	0.41	13.3	1886	3465	2676
PS9530645	X91P241	-	-	+	22	3	47	32	0.65	53	53	0.91	13.3	1994	3303	2649
PS9830S316	X92P028	-	+	+	18	2	65	12	0.65	107	46	0.49	13.1	1630	3477	2554
PS9830S307	X92P028	-	+	+	21	2	65	10	0.15	106	44	0.42	15.5	1562	3282	2422
PS9530726*	X91P241	-	-	+	16	2	33	18	0.56	48	38	0.62	14.6	1878	2955	2417
PS9830S523	X92P056	-	+	+	18	2	61	9	0.14	105	42	0.39	13.7	1750	3059	2405
PS9430706	X91P091	-	+	+	23	2	64	11	0.16	130	52	0.31	13.7	1740	2902	2321
PS9830F035	X91P234	+	-	+	21	2	81	10	0.13	109	39	0.26	17.1	1802	2331	2067
Grand Mean					19	2	55	15	0.34	94	46	0.55	14.2	1921	3353	2637
C.V. (%)														8.7	12.1	12.5
LSD $_{(\alpha=0.05)}$														234	563	317
Planting Date														10/04/01	10/05/01	
Harvest Date														10/29/02	08/19/02	

Leaf type; + = normal leaf, - = *afila* or semileafless type.
Plant type; + = tall plant type, - = short plant type.
* = green cotyledon; remainder are yellow cotyledon.
Fw = Fusarium wilt race 1; + = resistant, - = susceptible.
Pod and plant height were measured at the green pod stage and at harvest maturity.
Pod and plant height indices were determined by dividing the value at harvest maturity by the green pod stage value.
Agronomic data are means of three replications at Pullman, WA.
Yield data are means of three replications at Pullman, WA and Genesee, ID.

Table 18. Mean Yields (kg/ha) of Pea Lines in the Advanced Clear Seed Coat Winter Pea Yield Trial, 1998 - 2002

Cultivar	Origin	Leaf Type	Plant Type	1998	1999	2000	2001	2002
PS9830S358	X93P060	-	-	....	....	....	2280	3141
PS9830S431	X95P679	+	+	....	....	....	2525	3009
PS9830F011	X92P056	-	-	....	....	4124	2243	2938
PS9630448	X92P056	-	+	....	517	4347	2314	2923
PS9830F010	X92P056	-	+	....	....	....	2396	2709
PS9830F009	X92P056	-	+	....	....	4505	2332	2689
PS9830S329	X92P056	-	+	....	....	....	2053	2676
PS9530645	X91P241	-	-	....	....	1899	1941	2649
PS9830S316	X92P028	-	+	....	....	....	2153	2554
PS9830S307	X92P028	-	+	....	....	....	1709	2422
PS9530726*	X91P241	-	-	1228	612	2877	2340	2417
PS9830S523	X92P056	-	+	....	....	....	2025	2405
PS9430706	X91P091	-	+	....	....	2508	2126	2321
PS9830F035	X91P234	+	-	....	....	....	2244	2067
Grand Mean				1680	630	3787	2215	2637
LSD $_{(\alpha=0.05)}$				237	271	918	462	317

Leaf type; + =normal leaf, - =*afila* or semileafless type.
Plant type; + =tall plant type, - =short plant type.
* = Green Cotyledon – Remainder have Yellow Cotyledons.
Yield data are from Pullman, WA and Genesee, ID.

Table 19. Agronomic and Yield Data from the Advanced Austrian Winter Pea Yield Trial, 2002 (0221F)

Cultivar	Origin	Leaf Type	Plant Type	Nodes to Fst Flwr	Pods/ Peduncle	Pod Ht (green)	Pod Ht (mature)	Pod Ht Index	Plant Ht (green)	Plant Ht (mature)	Plant Ht Index	Weight 100 Seed	Mean Seed Yield
						..cm..	..cm..		..cm..	..cm..		..g..	..kg/ha..
PS9430119	X91P070	+	+	16	2	59	9	0.15	109	50	0.47	14.4	2488
PS9630177	X92P024	-	+	20	2	80	8	0.10	118	45	0.38	12.4	2167
Melrose	-------	+	+	18	2	68	8	0.12	114	47	0.42	12.6	2101
PS9630042	X91P263	-	+	19	3	70	10	0.14	109	48	0.44	13.7	2010
Granger_Clear	-------	-	+	16	2	62	9	0.15	110	47	0.43	15.1	1901
Granger	-------	-	+	19	2	70	5	0.07	112	49	0.43	14.9	1884
PS9530174	X91P241	-	-	16	2	43	12	0.27	67	49	0.74	16.8	1781
Grand Mean				18	2	64	9	0.14	105	48	0.47	14.3	2048
C.V. (%)				11	17	13	30	23.00	7	8	13		12
LSD (α=0.05)				3	1	12	4	0.05	11	5	0.09		364

Agronomic data and yield are means of three replications at Pullman, WA.
Pod height was measured at the green pod stage and at harvest Maturity.
Plant height was measured at the green pod stage and at harvest maturity.
Plant height index was determined by dividing the canopy height at harvest maturity by the total plant height.
Pod height index was determined by dividing the pod height at harvest maturity by the green pod height.

Table 20. Mean Yields (kg/ha) of Pea Lines in Advanced Austrian Winter Pea Yield Trial, 1998 - 2002

Cultivar	Origin	1998	1999	2000	2001	2002
PS9430119	X91P070	2722	730	3925	3037	2488
PS9630177	X92P024	….	760	2896	2382	2167
Melrose	-------	2235	1013	3573	2611	2101
PS9630042	X91P263	….	820	3735	2459	2010
Granger_Clear	-------	….	….	….	….	1901
Granger	-------	2502	388	4196	3029	1884
PS9530174	X91P241	….	606	3894	3158	1781
Grand Mean		2357	1858	3703	2779	2048
LSD (α=0.05)		123	172	990	501	364

Yield data are means of three replications at each location, over three locations.

Table 21. Agronomic and Yield Data for Development of Winter Pea Production Systems, 2002 (0240F)

Early (10-05-01) and Late (10-29-01) Fall Planting – 2001 - Near Rosalia, WA

Fall Seeding Rate - 80 seed m^2 (118 and 126 kg/ha respectively)

Cultivar	Std. Count Fall	Std. Count Spring	Plant Ht. Green	Plant Ht. Maturity	Plant Ht. Index.	Harvest Index	Mean Yld. Early Fall	Mean Yld. Late Fall	Mean Yield
	..plants/m^2..	..plants/m^2..	..cm..	..cm..			..kg/ha..	..kg/ha..	..kg/ha..
PS9430706	39	61	105	48	0.46	0.44	2628	1662	2145
PS9530726	29	60	46	34	0.73	0.48	2067	1389	1728
Mean	34	60	76	41	0.60	0.46	2347	1525	1936
C.V. (%)	34.2	27.4	10.2	7.4	10.6	4.4	3.6	4.8	10.1
LSD $_{(\alpha=0.05)}$	14	10	5	2	0.04	0.01	102	89	121

Yield Interaction of Tall (30 cm) and Short (10 cm) Stubble Height vs. Dry Pea Line - Early Fall Planting - kg/ha

	PS9430706	PS9530726	LSD $_{(\alpha=0.05)}$ = 145
Tall	2771	2145	
Short	2485	1988	

Yield Interaction of Tall (30 cm) and Short (10 cm) Stubble Height vs. Dry Pea Line - Late Fall Planting - kg/ha

	PS9430706	PS9530726	LSD $_{(\alpha=0.05)}$ = 127
Tall	1566	1386	
Short	1758	1392	

Yield Interaction of Tall and Short Stubble Height vs. Dry Pea Line - Combined Planting Dates - kg/ha

	PS9430706	PS9530726	LSD $_{(\alpha=0.05)}$ = 171
Tall	2169	1766	
Short	2122	1690	

Spring (04-12-02) Planting – 2002 - Near Rosalia, WA

Spring Seeding Rate – 80 seed m^2 (187 and 142 kg/ha respectively)

Cultivar	Plant Ht. Green	Plant Ht. Maturity	Plant Ht. Index	Harvest Index	Mean Yld. Spring
	..cm..	..cm..			..kg/ha..
Mozart	37	32	0.88	0.53	1391
Delta	34	27	0.79	0.50	891
Mean	35	30	0.84	0.51	1141
C.V. (%)	9.6	18.3	13.3	5.7	17.7
LSD $_{(\alpha=0.05)}$	4	7	0.14	0.04	245

Yield Interaction of Tall and Short Stubble Height vs. Dry Pea Line - Spring Planting - kg/ha

	Mozart	Delta	LSD $_{(\alpha=0.05)}$ = 347
Tall	1379	853	
Short	1403	929	

Mean Soil Moisture in Percent at Four Depths

	0-30 cm	30-60 cm	60-90 cm	90-120 cm
Fall	14.2	9.0	9.5	12.1
Spring	19.6	18.1	18.0	18.8
Harvest	11.6	13.4	14.6	16.4

Table 21. Agronomic and Yield Data for Development of Winter Pea Production Systems, 2002 (0240F) Continued

Early(10-05-01) and Late (11-02-01) Fall Planting – 2001 - Near Genesee, ID

Fall Seeding Rate - 80 seed m^2 (118 and 126 kg/ha respectively)

Car	Std. Count 11-07-20ultiv02	Std. Count 04-09-2002	Harvest Index	Mean Yld. Early Fall	Mean Yld. Late Fall	Mean Yield
	..plants/m^2..	..plants/m^2..		..kg/ha..	..kg/ha..	..kg/ha..
PS9430706	70	78	0.36	4038	3918	3978
PS9530726	55	66	0.50	3482	3006	3244
Mean	63	72	0.43	3760	3462	3611
C.V. (%)	22.7	12.4	6.3	6.0	11.0	11.3
LSD $_{(\alpha=0.05)}$	17	6	0.02	275	463	253

Yield Interaction of Tall (30 cm) and Short (10 cm) Stubble Height vs. Dry Pea Line - Early Fall Planting - kg/ha

	PS9430706	PS9530726
Tall	3910	3443
Short	4166	3521

LSD $_{(\alpha=0.05)}$ = 388

Yield Interaction of Tall (30 cm) and Short (10 cm) Stubble Height vs. Dry Pea Line - Late Fall Planting - kg/ha

	PS9430706	PS9530726
Tall	4094	3032
Short	3741	2980

LSD $_{(\alpha=0.05)}$ = 655

Yield Interaction of Tall and Short Stubble Height vs. Dry Pea Line - Combined Fall Planting Dates - kg/ha

	PS9430706	PS9530726
Tall	4002	3238
Short	3954	3251

LSD $_{(\alpha=0.05)}$ = 358

Spring (04-12-02) Planting – 2002 - Near Genesee, ID

Spring Seeding Rate - 80 seed m^2 (187 and 142 kg/ha respectively)

Cultivar	Harvest Index	Mean Yld. Spring
		..kg/ha..
Mozart	0.53	2882
Delta	0.54	2213
Mean	0.54	2547
C.V. (%)		8.4
LSD $_{(\alpha=0.05)}$		259

Yield Interaction of Tall (30 cm) and Short (10 cm) Stubble Height vs. Dry Pea Line Spring Planting - kg/ha

	Mozart	Delta
Tall	2727	2229
Short	3037	2198

LSD $_{(\alpha=0.05)}$ = 366

Mean Soil Moisture in Percent at Four Depths

	0-30 cm	30-60 cm	60-90 cm	90-120 cm
Fall	21.1	12.3	10.1	11.5
Spring	21.6	22.9	18.2	17.4
Harvest	11.9	11.8	10.2	12.7

Table 22. Yield Data in kg/ha of Winter Pea PS9530726 - Population Study, 2002 (0250F)

Four Sowing Rates – Fall 2001 - Near Rosalia, WA

10-05-01 Planting Date

Rates			Std. Count Fall	Std. Count Spring	Mean Seed Yield.
..multiplier..	..seed/m^2..	..kg/ha..	..plants/m^2..	..plants/m^2..	..kg/ha..
0.5x	40	63	16	36	1964
1.0x	80	126	33	74	2488
1.5x	120	190	55	79	2957
2.0x	160	253	82	116	3056
Mean			47	76	2617
C.V. (%)			25.9	24.2	7.1
LSD (α=0.05)			16	24	255

Four Sowing Rates – Fall 2001 - Near Genesee, ID

10-05-01 Planting Date

Rates			Std. Count Fall	Std. Count Spring	Mean Seed Yield.
..multiplier..	..seed/m^2..	..kg/ha..	..plants/m^2..	..plants/m^2..	..kg/ha..
0.5x	40	63	24	50	2541
1.0x	80	126	58	65	3101
1.5x	120	190	89	113	2786
2.0x	160	253	126	127	2683
Mean			74	89	2778
C.V. (%)			13.9	14.6	7.2
LSD (α=0.05)			14	17	264

Lentil Trial Results:

Twenty-seven entries and five check varieties (‘Pennell’, ‘Merrit’, ‘Richlea’, ‘Mason’, and ‘Brewer’) were included in the advanced large-seeded yellow lentil yield nursery in 2002. The nursery was planted at three locations (Pullman and Farmington, WA, and Genesee, ID) (Tables 23, 24, and 25). Yields were generally depressed due to the cool and dry spring and the exceptionally dry summer. Mean yield of the nursery over the three locations was 1203 kg/ha (about 1083 pounds per acre). Richlea continued to be the highest yielding lentil variety in the trial and was consistent over the past four years. Merrit and Pennell, the two recently released varieties performed well and had yields of 1387 and 1364 kg/ha, respectively. Each has larger seed size when compared to Brewer and Richlea and Pennell lacks seed coat mottling. A specialty type for the Spanish market has been proposed for release. The line, LC760209C, is a “Castillion” type with large seed size, seed coat mottling and reportedly is suited for precooked lentil uses in Spain. It is anticipated that this line will have limited use. Overall, the selections in the trial have been selected for good plant height indices and have good standing ability. Data collected on the twenty-seven selections in the trial indicate that progress has been made in improving seed weights and yields as well as the standing ability of the lentil selections. Future variety releases will stand more erect, ensuring greater ease of harvest, seeds will be larger and higher yields will be realized.

Advanced yield trials of Turkish red, Eston, and Spanish Brown types were also planted at three locations (Pullman, Farmington and Genesee, ID) (Tables 26, 27, and 28). Two Turkish red lines, with two and three years data, respectively, could be candidates for release. Of these two selections, LC99602724T was the highest yielding at 1399 kg/ha (about 1260 lbs/acre) while LC8602303T yielded 1378 kg/ha (about 1240 lbs/acre). The check variety Crimson had a mean yield of 1232 kg/ha (about 1108 lbs/acre). The major objectives in selection of Turkish red types is the improvement of standing ability, plant height and seed quality.

Eston and Athena were used as checks in to compare recent selections (Tables 29, 30, and 31). Eston was the highest yielding, although several selections (LC760963E, LC99602477E and LC0060831E) were similar in yield. Two Spanish Brown type lines (LC99602427P and LC0060818P) had comparable yields to Pardina (Tables 32,33, and 34). The former selection has been the highest yielding Spanish Brown in the trials over the past two years and may be proposed for release depending on performance in 2003 and seed quality traits.

The preliminary yield trial for large yellow lentil selections contained 61 selections and seven checks (Table 35). The Laird type lines were selected for exceptionally large seeds prior to inclusion in this nursery, which was planted at Pullman, WA. Lines in this preliminary trial were also selected for increased biomass and residue production as well as standing ability.

The preliminary screening nursery contained 105 selections that were evaluated for the first time at Pullman, WA (Table 37). The nursery contained 31 large yellow lentil

selections that were scored for large uniform seed size with no mottling and blunt seed edge. The preliminary screening nursery also contained 6 zero-tannin lines, 10 Spanish brown type lines, 21 Eston type lines, 15 Turkish red type lines, and 1 green cotyledon line. All were evaluated for days to flowering, days to maturity and yield. Selection was also made for good lodging resistance. Data from these lines will be evaluated and promising selections will be advanced to preliminary yield trials in 2003.

POTENTIAL VARIETY RELEASES:

Lentil selection LC760209C has been proposed for release with the tentative name **'Castillion'**. The variety should have ready acceptance in Spain for the pre-cooked lentil market. A Turkish red selection, either LC99602724T or LC8602303T, are potential releases depending on performance in 2003.

Table 23. Summary (kg/ha) of the Advanced Large Yellow Lentil Yield Trial over Locations, 2002 (0252)

Cultivar	Origin	Farmington	Genesee	Pullman	Mean Seed Yield
Richlea	-------	1384	1664	1329	1459
LC99600273L	X93L025	1500	1428	1243	1390
Merrit	X90L010	1453	1569	1138	1387
LC99602075L	X96L092	1376	1504	1265	1382
LC860359L	X93L035	1312	1362	1467	1380
Pennell	X89L101	1587	1301	1205	1364
LC99600153L	X93L008	1419	1426	1231	1359
LC99600087L	X93L035	1359	1351	1274	1328
LC7601080R	X89L039	1115	1493	1327	1312
LC760139L	HA84G12	1318	1473	1139	1310
LC99600345L	X93L027	1362	1367	1186	1305
Mason	-------	1113	1580	1220	1304
LC860616L	X95L073	1225	1284	1337	1282
LC660272L	X89L080	1459	1114	1262	1278
LC860443L	X93L011	1177	1367	1237	1260
LC99600747L	X95L078	1256	1328	1150	1245
LC99602173L	X96L096	1369	1232	1113	1238
Brewer	-------	1175	1275	1248	1233
LC760722L	X95L233	1139	1358	1197	1231
LC99602150L	X96L095	1311	1353	1030	1231
LC99600176L	X93L008	1294	1343	1030	1222
LC99600058L	X93L035	1208	1422	973	1201
LC860953L	X95L089	1246	1189	1129	1188
LC8601384L	X95L233	1282	1176	1059	1172
LC99601165L	X95L090	1079	1273	1127	1160
LC99601761L	X95L245	1052	1246	1177	1158
LC760209C	X89L007	1121	1259	1093	1158
LC860945L	X95L089	1157	1139	1070	1122
LC760739L	X95L235	1177	1120	984	1094
LC99601934L	X96L077	1022	1225	883	1043
LC99601325L	X95L093	902	1037	1054	998
LC760576L	X95L079	819	691	759	756
Grand Mean		1243	1311	1154	1203
C.V. (%)		8	10	8	27
LSD $_{(\alpha=0.05)}$		137	173	121	251
Planting Date		4/23/2002	4/22/2002	4/26/2002	
Harvest Date		9/3/2002	8/13/2002	8/16/2002	

Yield data are means of three replications at each location, over all locations.

Table 24. Agronomic Data for the Advanced Large Yellow Lentil Yield Trial, 2002 (0252)

Cultivar	Origin	Days to Flower	Days to Maturity	Pods/ Peduncle	Pod Ht (green)	Plant Ht (Green)	Weight 100 Seed
					..cm..	..cm..	..g..
Richlea	-------	62	101	2	24	41	5.7
LC99600273L	X93L025	64	103	2	23	40	7.1
Merrit	X90L010	56	99	2	21	36	6.5
LC99602075L	X96L092	58	100	2	21	38	7.6
LC860359L	X93L035	63	99	3	24	38	6.8
Pennell	X89L101	61	100	2	20	34	6.9
LC99600153L	X93L008	63	101	2	24	46	6.1
LC99600087L	X93L035	63	99	3	28	42	6.6
LC7601080R	X89L039	59	98	2	19	35	5.5
LC760139L	HA84G12	59	100	2	20	37	6.3
LC99600345L	X93L027	60	100	3	21	41	6.7
Mason	-------	57	99	2	16	31	6.8
LC860616L	X95L073	59	100	2	20	40	7.5
LC660272L	X89L080	59	102	2	21	41	7.6
LC860443L	X93L011	60	100	2	22	37	8.0
LC99600747L	X95L078	59	100	2	26	47	7.0
LC99602173L	X96L096	59	101	2	19	38	6.4
Brewer	--------	56	99	2	20	34	6.4
LC760722L	X95L233	59	100	2	21	42	7.4
LC99602150L	X96L095	56	100	2	20	38	7.4
LC99600176L	X93L008	59	101	2	23	44	6.9
LC99600058L	X93L035	59	102	2	25	40	6.5
LC860953L	X95L089	59	101	2	21	40	7.6
LC8601384L	X95L233	60	101	2	21	42	7.7
LC99601165L	X95L090	59	101	2	20	42	7.7
LC99601761L	X95L245	56	101	2	20	39	7.7
LC760209C	X89L007	56	100	2	20	37	7.3
LC860945L	X95L089	59	101	2	19	36	7.5
LC760739L	X95L235	59	102	2	23	43	8.0
LC99601934L	X96L077	59	100	2	19	35	8.7
LC99601325L	X95L093	58	100	2	22	41	7.8
LC760576L	X95L079	59	102	2	18	34	9.2
Grand Mean		59	100	2	21	39	7.2
C.V. (%)		1	1		9	6	
LSD $_{(\alpha=0.05)}$		1	1		3	3	

Pod height was measured at the green pod stage.
Plant height was measured at the green pod stage.
Agronomic data are means of three replications at Pullman, WA.

Table 25. Mean Yields (kg/ha) of Lentil Lines in the Advanced Large Yellow Lentil Yield Trial, 1998 - 2002

Cultivar	Origin	1998	1999	2000	2001	2002
Richlea	-------	1898	1790	1407	1968	1459
LC99600273L	X93L025	....	....	....	....	1390
Merrit	X90L010	1855	1599	1125	1759	1387
LC99602075L	X96L092	....	....	....	....	1382
LC860359L	X93L035	....	....	....	1764	1380
Pennell	X89L101	1757	1539	1100	1767	1364
LC99600153L	X93L008	....	....	....	....	1359
LC99600087L	X93L035	....	....	....	....	1328
LC7601080R	X89L039	....	....	1361	1747	1312
LC760139L	HA84G12	....	....	1374	1793	1310
LC99600345L	X93L027	....	....	....	....	1305
Mason	-------	1787	1413	1368	1674	1304
LC860616L	X95L073	....	....	....	1824	1282
LC660272L	X89L080	....	1441	1185	1652	1278
LC860443L	X93L011	....	....	....	1667	1260
LC99600747L	X95L078	....	....	....	....	1245
LC99602173L	X96L096	....	....	....	....	1238
Brewer	--------	1739	1452	1264	1585	1233
LC760722L	X95L233	....	....	1257	1668	1231
LC99602150L	X96L095	....	....	....	....	1231
LC99600176L	X93L008	....	....	....	....	1222
LC99600058L	X93L035	....	....	....	....	1201
LC860953L	X95L089	....	....	....	1613	1188
LC8601384L	X95L233	....	....	....	1530	1172
LC99601165L	X95L090	....	....	....	....	1160
LC99601761L	X95L245	....	....	....	....	1158
LC760209C	X89L007	....	....	....	1720	1158
LC860945L	X95L089	....	....	....	1575	1122
LC760739L	X95L235	....	....	1105	1639	1094
LC99601934L	X96L077	....	....	....	....	1043
LC99601325L	X95L093	....	....	....	....	998
LC760576L	X95L079	....	....	....	....	756
Grand Mean		1589	1484	1181	1607	1203
LSD $_{(\alpha=0.05)}$		194	150	163	83	251

Yield data are means of three replications at each location, over three locations in each year.

Table 26. Summary (kg/ha) of the Advanced Turkish Red Type Lentil Yield Trial over Locations, 2002 (0251T)

Cultivar	Origin	Farmington	Genesee	Pullman	Mean Seed Yield
LC99602724T	X95L041	1512	1547	1138	1399
LC8602303T	X95L035	1540	1451	1143	1378
LC00600981T	X95L034	1409	1438	1174	1340
LC99602712T	X95L041	1399	1607	1014	1340
LC8602354T	X95L041	1370	1421	1229	1340
LC99602702T	X95L036	1281	1504	1225	1337
LC00601003T	X95L041	1250	1392	1269	1304
LC99602972T	X95L071	1257	1502	1117	1292
LC00601006T	X95L041	1207	1512	1059	1259
LC00601002T	X95L041	1243	1409	1123	1258
Crimson	-------	1160	1367	1168	1232
LC8602419T	X95L051	1072	1319	875	1089
LC00601034T	X95L051	916	1255	923	1031
LC00600977T	X95L033	607	1511	958	1025
LC00600979T	X95L033	503	1562	890	985
LC00601135T	-------	271	1233	863	789
Grand Mean		1125	1439	1073	1212
C.V. (%)		13	6	11	17
LSD $_{(\alpha=0.05)}$		207	114	163	71
Planting Date		4/23/2002	4/22/2002	4/26/2002	
Harvest Date		9/3/2002	8/15/2002	8/20/2002	

Yield data are means of three replications at each location, over all locations.

Table 27. Agronomic Data for the Advanced Turkish Red Type Lentil Yield Trial, 2002. (0251T)

Cultivar	Origin	Days to First Flower	Days to Maturity	Pods/ Peduncle	Pod Ht (green)	Plant Ht (green)	Weight 100 Seed
					..cm..	..cm..	..g..
LC99602724T	X95L041	56	91	2	13	31	4.0
LC8602303T	X95L035	58	95	2	15	33	3.6
LC00600981T	X95L034	56	88	2	14	28	4.1
LC99602712T	X95L041	57	92	2	12	28	4.1
LC8602354T	X95L041	58	93	2	18	37	4.6
LC99602702T	X95L036	55	90	2	14	29	3.6
LC00601003T	X95L041	56	91	2	13	29	4.1
LC99602972T	X95L071	55	89	2	14	29	4.0
LC00601006T	X95L041	56	92	2	13	30	3.9
LC00601002T	X95L041	58	92	2	16	29	3.8
Crimson	-------	60	91	2	14	30	3.5
LC8602419T	X95L051	61	94	2	20	40	3.9
LC00601034T	X95L051	57	95	2	12	34	3.6
LC00600977T	X95L033	57	94	2	17	34	4.3
LC00600979T	X95L033	58	91	2	16	30	4.3
LC00601135T	-------	57	90	2	19	37	3.3
Grand Mean		57	92	2	15	32	3.9
C.V.		1	2		14	7	
LSD $_{(\alpha=0.05)}$		1	2		3	3	

.

Pod height was measured at the green pod stage.

Plant height was measured at the green pod stage.

Agronomic data are means of three replications at Pullman, WA

Table 28. Mean Yields (kg/ha) of Lentil Lines in the Advanced Turkish Red Type Lentil Yield Trial, 1998 - 2002

Cultivar	Origin	1998	1999	2000	2001	2002
LC99602724T	X95L041	....	....	....	1419	1399
LC8602303T	X95L035	....	....	1318	1489	1378
LC00600981T	X95L034	....	....	....	....	1340
LC99602712T	X95L041	....	....	....	1437	1340
LC8602354T	X95L041	....	....	1381	1449	1340
LC99602702T	X95L036	....	....	....	1401	1337
LC00601003T	X95L041	....	....	....	....	1304
LC99602972T	X95L071	....	....	....	1480	1292
LC00601006T	X95L041	....	....	....	....	1259
LC00601002T	X95L041	....	....	....	....	1258
Crimson	-------	1719	1605	1462	1400	1232
LC8602419T	X95L051	....	....	1146	1193	1089
LC00601034T	X95L051	....	....	....	....	1031
LC00600977T	X95L033	....	....	....	....	1025
LC00600979T	X95L033	....	....	....	....	985
LC00601135T	-------	....	....	....	....	789
Grand Mean		1615	1410	1152	1270	1212
LSD $_{(\alpha=0.05)}$		162	149	223	86	71

Yield data are means of three replications at each location, over three locations in each year.

Table 29. Summary (kg/ha) of the Advanced Eston Type Lentil Yield Trial over Locations, 2002 (0251E)

Cultivar	Origin	Farmington	Genesee	Pullman	Mean Seed Yield
Eston	-------	778	931	1157	955
Athena	-------	591	911	1267	923
LC760963E	-------	1033	710	1022	922
LC99602477E	X93L035	655	1108	995	919
LC00600831E	X93L035	501	1048	1104	884
LC00600854E	X97L025	721	775	1100	865
LC8601847E	X93L035	614	844	1095	851
LC7601086E	X93L035	468	1074	898	813
LC00600829E	X93L035	624	859	768	750
LC00600839E	X93L035	373	956	864	731
Grand Mean		636	922	1027	861
C.V. (%)		28	18	8	19
LSD $_{(\alpha=0.05)}$		257	237	124	72
Planting Date		4/23/2002	4/22/2002	4/26/2002	
Harvest Date		9/3/2002	8/15/2002	8/27/2002	

Yield data are means of three replications at each location, over all locations.

Table 30. Agronomic Data for the Advanced Eston Type Lentil Yield Trial, 2002 (0251E)

Cultivar	Origin	Days to Flower	Days to Maturity	Pods/ Peduncle	Pod Ht (green)	Plant Ht (Green)	Weight 100 Seed
					..cm..	..cm..	..g..
Eston	-------	59	100	2	17	35	3.5
Athena	-------	59	98	2	17	31	4.5
LC760963E	-------	59	102	2	18	39	4.1
LC99602477E	X93L035	58	99	2	16	32	4.2
LC00600831E	X93L035	58	98	2	14	31	4.1
LC00600854E	X97L025	63	100	2	19	36	3.7
LC8601847E	X93L035	58	98	2	16	33	4.1
LC7601086E	X93L035	58	99	2	16	33	4.2
LC00600829E	X93L035	60	100	2	20	37	3.7
LC00600839E	X93L035	58	98	2	17	34	4.2
Grand Mean		59	99	2	17	34	4.0
C.V. (%)		1	1		9	5	
LSD $_{(\alpha=0.05)}$		1	2		2	2	

Pod height was measured at the green pod stage.
Plant height was measured at the green pod stage.
Agronomic data are means of three replications at Pullman, WA.

Table 31. Mean Yields (kg/ha) of Lentil Lines in the Advanced Eston Type Lentil Yield Trial, 1999 - 2002

Cultivar	Origin	1999	2000	2001	2002
Eston	-------	1583	1081	1583	955
Athena	-------	....	....	1748	923
LC760963E	-------	1415	1156	1465	922
LC99602477E	X93L035	....	....	1694	919
LC00600831E	X93L035	....	....	....	884
LC00600854E	X97L025	....	....	....	865
LC8601847E	X93L035	....	1277	1647	851
LC7601086E	X93L035	1828	1339	1568	813
LC00600829E	X93L035	....	....	....	750
LC00600839E	X93L035	....	....	....	731
Grand Mean		1381	1090	1534	861
LSD $_{(\alpha=0.05)}$		147	134	86	72

Yield data are means of three replications at each location, over three locations in each year.

Table 32. Summary (kg/ha) of the Advanced Pardina Type Lentil Yield Trial over Locations, 2002 (0251P)

Cultivar	Origin	Farmington	Genesee	Pullman	Mean Seed Yield
LC99602427P	X93L018	1313	1428	1566	1436
LC00600818P	X93L018	1076	1785	1398	1420
Pardina	-------	1081	1742	1404	1409
LC8601817P	X93L021	1355	1449	1367	1390
LC8601787P	X93L018	1122	1625	1341	1363
LC00600812P	X93L010	1039	1579	1460	1359
LC00600822P	X93L021	1160	1729	1124	1338
LC000010D	-------	1298	1429	1137	1288
LC00600813P	X93L018	894	1594	1306	1265
LC00600827P	X93L017	898	1438	1192	1176
LC00600820P	X93L018	795	1579	921	1098
LC00600952P	X93L017	1001	1093	1167	1087
LC00600929P	X93L013	682	1298	999	993
LC00600811P	X93L010	802	1119	872	931
LC00600940P	X93L017	805	1030	761	865
LC00600954P	X93L017	472	1051	979	834
Grand Mean		987	1435	1187	1203
C.V. (%)		14	12	8	20
LSD $_{(\alpha=0.05)}$		192	236	140	80
Planting Date		4/23/2002	4/22/2002	4/26/2002	
Harvest Date		9/3/2002	8/15/2002	8/27/2002	

Yield data are means of three replications at each location, over all locations.

Table 33. Agronomic Data for the Advanced Pardina Type Lentil Yield Trial, 2002 (0251P)

Cultivar	Origin	Days to Flower	Days to Maturity	Pods/ Peduncle	Pod Ht (green)	Plant Ht (Green)	Weight 100 Seed
					..cm..	..cm..	..g..
LC99602427P	X93L018	57	98	2	16	33	4.4
LC00600818P	X93L018	59	103	2	19	38	4.2
Pardina	-------	56	94	2	15	31	4.2
LC8601817P	X93L021	56	93	2	15	31	4.7
LC8601787P	X93L018	58	98	2	18	31	4.7
LC00600812P	X93L010	57	98	2	15	29	4.7
LC00600822P	X93L021	56	94	2	13	26	3.9
LC000010D	-------	62	95	3	19	34	3.0
LC00600813P	X93L018	56	97	2	13	27	3.3
LC00600827P	X93L017	59	100	2	10	28	3.5
LC00600820P	X93L018	56	98	2	14	30	3.9
LC00600952P	X93L017	59	100	2	13	28	3.5
LC00600929P	X93L013	60	97	2	17	31	3.4
LC00600811P	X93L010	58	100	2	16	36	4.1
LC00600940P	X93L017	59	100	2	12	27	3.7
LC00600954P	X93L017	60	100	2	16	32	3.5
Grand Mean		58	98	2	15	31	3.9
C.V. (%)		1	2		14	5	
LSD $_{(\alpha=0.05)}$		1	3		3	2	

Pod height was measured at the green pod stage.
Plant height was measured at the green pod stage.
Agronomic data are means of three replications at Pullman, WA.

Table 34. Mean Yields (kg/ha) of Lentil Lines in the Advanced Pardina Type Lentil Yield Trial, 1998 - 2002

Cultivar	Origin	1998	1999	2000	2001	2002
LC99602427P	X93L018	....	....	....	1892	1436
LC00600818P	X93L018	....	....	....	....	1420
Pardina	-------	2389	1770	1765	1776	1409
LC8601817P	X93L021	....	....	1647	1679	1390
LC8601787P	X93L018	....	....	1725	1837	1363
LC00600812P	X93L010	....	....	....	....	1359
LC00600822P	X93L021	....	....	....	....	1338
LC000010D	-------	....	....	....	1636	1288
LC00600813P	X93L018	....	....	....	....	1265
LC00600827P	X93L017	....	....	....	....	1176
LC00600820P	X93L018	....	....	....	....	1098
LC00600952P	X93L017	....	....	....	....	1087
LC00600929P	X93L013	....	....	....	....	993
LC00600811P	X93L010	....	....	....	....	931
LC00600940P	X93L017	....	....	....	....	865
LC00600954P	X93L017	....	....	....	....	834
Grand Mean		1823	1565	1511	1659	1203
LSD $_{(\alpha=0.05)}$		118	181	204	112	80

Yield data are means of three replications at each location, over three locations in each year.

Table 35. Agronomic Data for the Preliminary Large Yellow Lentil Yield Trial, 2002 (0254)

Cultivar	Origin	Days to Flower	Days to Maturity	Pods/ Peduncle	Pod Ht (green)	Plant Ht (Green)	Weight 100 Seed	Mean Seed Yield
					..cm..	..cm..	..g..	..kg/ha..
LC00600010L	X93L035	63	102	3	23	40	6.7	1598
LC00600470L	X97L005	58	100	2	20	38	7.0	1522
Richlea	-------	61	101	2	19	38	5.5	1518
LC00600562L	X97L028	57	98	2	18	34	7.0	1355
LC00600683L	X97L042	59	103	2	20	38	7.9	1355
LC00600656L	X97L039	59	103	2	23	45	7.9	1352
CDC_Grandora	-------	64	102	3	23	42	7.1	1339
LC00600233L	X96L095	59	103	2	23	43	8.1	1337
Mason	-------	55	98	2	18	38	7.1	1332
LC00600698L	X97L042	59	103	2	23	38	7.9	1331
LC00600157L	X95L245	57	100	2	18	40	8.8	1320
LC000005L	-------	59	101	2	23	44	7.6	1319
LC00600774L	X97L052	59	100	3	20	39	6.5	1316
LC00601166e	-------	56	101	2	17	35	4.9	1316
LC00600572L	X97L029	57	102	2	21	41	7.8	1313
LC00600295L	X96L100	58	99	2	23	35	10.0	1306
LC00600423L	X96L118	60	103	2	20	38	8.0	1297
LC00600150C	X95L241	64	100	3	23	38	8.9	1269
LC00601231C	-------	57	99	2	19	37	7.2	1263
LC00600144L	X95L230	58	99	2	17	33	7.5	1258
LC00600560L	X97L028	57	99	2	17	35	7.6	1253
Pennell	X89L101	61	100	2	20	38	7.1	1241
LC00600747B	X97L050	61	101	2	20	39	6.1	1240
LC00600558L	X97L028	57	100	2	17	38	7.1	1231
LC00600051L	X93L026	60	100	2	18	39	6.7	1223
LC00600166L	X95L251	59	104	2	22	48	8.7	1221
CDC_Sovereign	-------	63	101	2	23	41	6.5	1209
LC00600168L	X95L251	60	103	2	21	43	8.4	1204
LC00600346L	X96L107	58	100	2	20	42	7.8	1201
LC00600139L	X95L220	62	97	3	24	39	6.4	1193
Merrit	X90L010	56	99	2	17	38	6.9	1183
LC00600086L	X93L036	63	103	2	25	43	7.4	1170
LC00600207L	X96L093	58	99	2	22	40	7.2	1165
LC00600128L	X95L093	59	102	2	21	40	7.7	1160
LC00600242L	X96L096	59	102	2	18	42	7.8	1148
LC00600067L	X93L027	63	102	2	21	38	7.7	1137
LC00600268L	X96L099	58	99	2	20	35	7.4	1120
LC00600394L	X96L111	59	101	2	17	39	7.8	1118
LC00600596L	X97L035	57	102	2	18	35	6.8	1117
LC00600746L	X97L050	62	102	2	21	43	6.6	1117
LC00600587L	X97L031	57	104	2	17	40	8.3	1116

Table 35. Agronomic Data for the Preliminary Large Yellow Lentil Yield Trial, 2002 (0254) Continued. Page 2 of 2

Cultivar	Origin	Days to Flower	Days to Maturity	Pods/ Peduncle	Pod Ht (green)	Plant Ht (Green)	Weight 100 Seed	Mean Seed Yield
					..cm..	..cm..	..g..	..kg/ha..
LC00600764L	X97L051	58	99	2	19	40	6.5	1115
LC00600256L	X96L096	59	100	2	23	40	7.5	1114
LC00600525B	X97L023	56	100	2	17	34	6.6	1112
Brewer	-------	56	98	2	17	39	6.1	1107
LC00600187L	X96L091	58	100	2	18	36	7.7	1106
LC00600262L	X96L099	59	105	2	19	38	8.7	1106
LC00600769L	X97L051	58	100	2	23	43	7.0	1102
LC00600206L	X96L093	59	99	2	20	40	7.1	1101
LC00600200L	X96L093	58	101	2	20	41	7.2	1099
LC00600465L	X97L005	58	100	2	20	41	7.8	1090
LC00600787L	X97L053	59	101	2	21	41	7.3	1081
LC00600392L	X96L111	56	102	2	18	39	8.2	1056
LC00600252L	X96L096	58	101	2	21	39	7.3	1037
LC00600374L	X96L111	56	102	2	15	37	8.4	1030
LC00600230L	X96L095	58	103	2	18	36	8.0	1013
LC00600217L	X96L095	58	104	2	20	41	8.1	991
LC00600807L	X97L012	58	102	2	17	41	6.5	964
LC00600208L	X96L093	59	102	2	23	41	7.0	961
LC00600738C	X97L048	58	100	2	20	38	6.7	951
LC00600296L	X96L100	58	100	2	20	37	8.7	922
LC00600663L	X97L040	56	102	2	22	42	6.5	916
LC00600219L	X96L095	59	102	2	15	37	7.0	896
LC00600212L	X96L095	59	103	2	18	40	7.2	873
LC00600146L	X95L236	57	100	2	22	38	7.7	845
LC00600664L	X97L040	57	102	2	22	40	6.8	839
LC00600786L	X97L053	58	101	2	18	32	8.4	776
LC00600427L	X97L001	56	99	2	14	34	6.7	772
Grand Mean		59	101	2	20	39	7.4	1158
C.V. (%)		1			13	6		8
LSD $_{(\alpha=0.05)}$		1			4	3		120

Planting date was 4/26/2002. Harvest date was 8/28/2002.

Pod height was measured at the green pod stage.

Plant height was measured at the green pod stage

Yield data and agronomic data are means of three replications at Pullman, WA. Days to Maturity taken from one replication.

Table 36. Agronomic Data for the Zero Tannin Lentil Yield Trial, 2002 (0263)

Cultivar	Origin	Days to Flower	Days to Maturity	Pods/ Peduncle	Pod Ht (green)	Plant Ht (Green)	Weight 100 Seed	Mean Seed Yield
					..cm..	..cm..	..g..	..kg/ha..
LC99602585Z	X95L004	58	99	2	14	31	3.4	1599
LC7601114Z	X93L001	57	100	2	19	38	5.7	1574
LC8601910Z	X93L001	59	102	2	18	42	5.8	1504
LC00600862Z	X93L001	58	100	2	19	40	5.4	1499
LC00600917Z	X95L005	56	100	2	12	33	4.8	1302
LC00600903Z	X95L004	57	101	2	12	31	3.7	1249
LC00600899Z	X95L004	56	102	2	12	31	4.3	1168
LC99602614Z	X95L005	56	99	2	14	30	4.7	1160
LC8601942Z	X93L004	60	100	2	20	37	6.5	1107
Brewer	-------	56	99	2	13	35	5.9	1087
Grand Mean		57	100	2	15	35	5.0	1325
C.V. (%)		1	1		28	6		8
LSD $_{(\alpha=0.05)}$		1	1		6	3		157

Planting date was 4/26/2002. Harvest date was 8/27/2002.

Pod height was measured at the green pod stage.

Plant height was measured at the green pod stage.

Yield data and agronomic data are means of three replications at Pullman, WA.

Table 37. Agronomic Data for the Preliminary Lentil Screening Nursery, 2002 (0255)

Cultivar	Origin	Days to Flower	Days to Maturity	Weight 100 Seed	Mean Seed Yield
				..g..	..kg/ha..
		Laird Type			
LC01600745L	X98L012	60	104	7.6	1644
LC01600686L	X97L086	58	99	6.6	1580
LC01600698L	X97L086	59	100	7.2	1578
LC01601333L	X96L091	58	102	7.4	1562
LC01600691L	X97L086	61	99	6.7	1371
LC01601051L	X93L035	64	100	6.6	1347
LC01600749L	X98L012	60	99	6.6	1261
LC01601394L	X96L110	60	101	8.1	1259
LC01601210L	X95L247	62	101	7.9	1222
LC01601192L	X95L243	58	101	7.4	1202
LC01600755L	X97L109	59	99	7.4	1196
LC01600719L	X98L010	60	98	6.3	1157
LC01601428L	X96L118	59	101	7.8	1131
LC01601205L	X95L245	59	104	9.0	1125
LC01601357L	X96L095	59	---	7.6	1111
LC01601016L	X93L035	62	100	6.9	1057
LC01600808L	X98L015	58	99	5.9	1051
LC01601591L	X97L051	58	102	7.2	1018
LC01601603L	X97L006	58	104	7.0	1018
LC01601590L	X97L051	58	102	7.0	1015
LC01601217L	X95L248	58	104	9.0	1006
LC01601184L	X95L243	56	101	8.0	989
LC01601606L	X97L006	60	104	7.5	923
LC01601353L	X96L095	58	102	8.0	916
LC01601225L	X95L248	59	104	8.8	854
LC01601461L	X97L009	60	101	7.8	801
LC01601343L	X96L093	59	101	7.1	732
LC01601548L	X97L042	58	102	7.5	712
LC01601325L	X96L090	58	103	7.2	702
LC01601169L	X95L241	62	102	8.5	674
LC01601106L	X95L221	58	102	6.9	600
Sub Mean-Lg Yell Cot, Laird Types		59	101	7.4	1091
		Brewer Type			
LC01600732B	X98L011	61	101	5.3	1625
		Richlea Type			
LC01602300R	X98L047	60	105	5.4	1561
LC01600828R	X97L093	66	99	5.1	1468
LC01600431R	-------	58	101	4.4	1448

Table 37. Agronomic Data for the Preliminary Lentil Screening Nursery, 2002 (0255) Continued

Cultivar	Origin	Days to Flower	Days to Maturity	Weight 100 Seed	Mean Seed Yield
				..g..	..kg/ha..
LC01600558R	-------	59	97	4.8	1315
LC01600856R	X97L094	60	100	4.8	1286
LC01602277R	X98L042	63	99	4.7	1279
LC01600680R	X98L007	58	99	4.3	1194
LC01600538R	-------	56	100	4.3	1155
LC01602252R	X98L039	63	99	5.1	1019
LC01600437R	-------	58	101	4.4	666
Ilina	-------	59	102	5.7	545
	Sub Mean-Brewer Type	60	100	4.9	1176
		Eston Type			
LC01602307E	X98L047	63	100	4.3	1620
LC01602304E	X98L047	61	100	4.3	1590
LC01600736E	X98L011	64	99	3.7	1514
LC01600830E	X98L017	61	101	3.6	1448
LC01602273E	X98L041	59	101	4.1	1446
LC01602341E	X98L054	59	100	3.2	1363
LC01600980E	X98L030	59	100	3.6	1358
LC01602232E	X98L036	60	98	3.9	1341
LC01600743E	X98L011	66	101	3.8	1332
LC01600968E	X98L034	59	100	3.5	1289
LC01600976E	X98L034	60	100	3.5	1275
LC01600981E	X98L030	60	101	3.5	1275
LC01600735E	X98L011	63	99	3.7	1251
LC01602230E	X98L036	60	99	4.4	1226
LC01600666E	X98L007	60	98	3.2	1161
LC01602383E	X98L060	61	105	3.7	1071
LC01601678E	X97L025	59	99	3.0	991
LC01602256E	X98L039	60	100	3.8	958
LC01601675E	X97L025	60	99	3.7	905
LC01600733E	X98L011	58	99	4.0	801
Naslada	-------	59	102	4.0	641
	Sub Mean-Eston Type	61	100	3.7	1231
		Pardina Type			
LC01601640P	X93L018	58	97	4.3	1534
LC01601641P	X93L018	58	98	4.5	1453
LC01601005P	X98L033	68	100	3.6	1411
LC01602245P	X98L038	58	97	4.2	1390
LC01600504P	-------	62	98	3.7	1368
Stella	-------	60	97	3.6	1347
LC01602243P	X98L038	58	97	4.0	1263

Table 37. Agronomic Data for the Preliminary Lentil Screening Nursery, 2002 (0255) Continued. Page 3 of 4

Cultivar	Origin	Days to Flower	Days to Maturity	Weight 100 Seed	Mean Seed Yield
				..g..	..kg/ha..
LC01600765P	X98L013	59	99	4.9	1249
LC01600389P	X96L060	59	99	4.2	1158
Stanka2	-------	58	98	3.1	727
Sub Mean-Pardina Type		60	98	4.0	1290
		Turkish Red Type			
LC01602062T	X96L057	56	98	4.5	1688
LC01601751T	X95L049	66	98	3.6	1428
LC01601752T	X95L050	66	98	3.5	1321
LC01601803T	X95L061	63	99	3.6	1292
LC01600405T	X96L063	56	97	4.2	1273
LC01601724T	X95L032	59	99	4.3	1142
LC01601798T	X95L061	63	99	3.9	1101
LC01600879T	X98L018	59	99	3.4	1026
LC01600947T	X97L097	60	99	3.3	998
LC01600873T	X98L018	59	99	3.5	971
LC01600372T	X95L258	66	99	3.3	957
LC01600957T	X98L025	60	100	3.8	937
LC01600944T	X97L097	62	99	3.4	922
LC01601732T	X95L041	58	97	3.9	822
Dwarf	-------	60	99	3.1	638
Sub Mean-Turkish Red Type		61	99	3.7	1101
		Emerald Type			
LC01600514e	-------	59	---	7.3	212
		Zero Tannin Type			
LC01601685Z	X93L001	59	103	5.4	1458
LC01601687Z	X93L001	58	103	5.7	1341
LC01601690Z	X93L001	59	103	6.3	1083
LC01601709Z	X93L033	62	104	5.4	1082
LC01601699Z	X93L006	58	100	6.2	978
LC01600556Z	-------	56	101	4.0	898
Sub Mean-Zero Tannin Type		59	102	5.5	1140
		Redchief Type			
Stanka3	-------	59	100	2.9	1455
Nadejda	-------	59	100	2.9	1420
LC01600426r	-------	60	99	5.3	1369
LC01600502r	-------	58	101	5.3	1276
Janitsa	-------	59	99	3.5	1209
LC01601936r	X95L267	58	99	5.6	1132

Table 37. Agronomic Data for the Preliminary Lentil Screening Nursery, 2002 (0255) Continued. Page 4 of 4

Cultivar	Origin	Days to Flower	Days to Maturity	Weight 100 Seed	Mean Seed Yield
				..g..	..kg/ha..
LC01600442r	-------	58	98	3.8	1114
LC01600468r	-------	58	100	3.4	648
LC01600513r	-------	59	106	4.8	504
Sub Mean-Redchief Type		59	100	4.2	1125
Grand Mean		60	98	5.1	1151

Planting date was 4/26/2002. Harvest date was 8/30/2002.
Pod and plant height were measured at the green pod stage.
Yield and agronomic data are from one plot of each line at Pullman, WA.

Table 38. Agronomic Data for the Canadian and Australian Lentil Observation Nursery, 2002 (0207L)

Cultivar	Weight 100 Seed	Seed Yield
	...g..	..kg/ha...
1207D-13	4.3	1490
1076-13	4.1	1382
1208D-35	4.2	1314
94-009L*97H5	4.4	1303
94-004L*97H11	6.4	1218
1119-2-3	3.4	1168
94-009L*98H069	3.8	1095
1211-41	4.7	1087
1145-3-6	3.4	1060
94-003L*97H26	4.4	1014
1254S-1	3.8	999
95-003L*96G6-98H007	3.3	990
95-013L*96G1-98H007	3.1	989
95-002L*96G3-98H002	3.2	985
1119-2-7	3.3	976
94-002L*97H29	2.3	975
94-004L*97H10	5.0	972
1110-13RY-5	2.9	918
Cassab	4.6	884
1125-1-5	2.8	867
Cobber	4.1	864
I94S160L*97H10	4.5	819
Digger	4.9	802
Nugget	4.3	797
Aldinga	4.7	795
95-003L*96G1-97H7	2.8	771
Matilda	5.1	672
ILL7220	3.0	620
Northfield	3.2	616
Cumra	4.3	350
Grand Mean	4.0	960

Agronomic data and yield are means of one replication at Pullman, WA.

Winter Lentil Trial Results:

Fourteen selections were included in the red cotyledon winter lentil nursery in 2002 and were grown at two locations, WSU Spillman Farm and near Genesee on Russ Zenner's farm (Tables 39 and 40). Winter hardy lentil lines are being targeted for direct seeding in standing wheat or barley stubble in order to aid in control of soil erosion. It is also expected that seed yield will be increased up to 50% over traditional spring types. Average seed yield at the Genesee site was 3217 kg/ha (2863 lb/a) and 250% of the average yield at Spillman Farm. Average yield across locations was 2255 kg/ha (2006 lb/a). LC9979010 produced an average yield of 2657 kg/ha (2364 lb/a) across the two locations. This selection was recently released and Foundation seed is being produced and should be available to producers in the fall of 2003. It has red cotyledons and is expected to fit well into traditional Turkish red lentil markets and also in markets in South Asia.

LC9979010 and LC9976079, a yellow cotyledon winter lentil, were included with the two winter pea selections described previously in a study to determine adaptation to direct seeding systems (Tables 44 and 45). Preliminary results indicate that winter pea and lentil have potential to provide producers with a viable alternative cropping system to spring sown legume crops. Direct sowing into standing stubble offers many advantages including control of soil erosion, snow capture and greater protection of small seedlings from harsh winter conditions.

Variety Release and Potential Variety release:

A small red cotyledon winter type lentil was recommended for release in September 2002. The selection, LC9979010 has small seeds with red cotyledons that should fit into certain lentil markets in the Middle East and South Asia. The selection has been tentatively named '**Morton**'. The selection has excellent winter hardiness and is adapted to direct seeding into cereal stubble in the fall. Limited quantities of Morton should be available to growers in the fall of 2003.

Table 39. Agronomic and Yield Data for the Advanced Red Cotyledon Winter Lentil Yield Trial, 2002 (0241F)

Cultivar	Origin	Pods/ Peduncle	Pod Ht (green)	Pod Ht (mature)	Pod Ht Index	Plant Ht (green)	Plant Ht (mature)	Plant Ht Index	Weight 100 Seed	Seed Yld Pullman	Seed Yld Genesee	Seed Yld Mean
			..cm..	..cm..		..cm..	..cm..		..g..	..kg/ha..	..kg/ha..	.kg/ha.
LC9979062	X92L043	3	9	10	1.00	31	30	0.97	3.4	1571	3900	2736
LC9979065	X92L043	3	13	9	0.73	31	27	0.89	3.2	1659	3739	2699
LC9979010	X92L043	3	13	10	0.77	31	25	0.84	3.3	1498	3816	2657
LC9979016	X92L043	3	13	13	0.99	37	34	0.87	3.1	1567	3658	2613
LC9979120	X92L043	3	11	9	0.86	33	25	0.89	2.8	1411	3175	2293
LC9978094	X92L040	3	16	13	0.83	38	22	0.61	3.4	1458	3038	2248
LC9976079	X92L035	2	12	10	0.88	33	29	0.88	3.6	1131	3283	2207
LC9978028	X92L040	2	13	9	0.72	36	28	0.81	2.9	1058	3331	2195
LC9978057	X92L040	3	11	8	0.76	33	23	0.75	3.4	1306	2862	2084
LC9440070	X92L001	2	12	11	0.90	31	30	0.87	5.7	1209	2955	2082
LC9440074	X92L001	2	16	8	0.50	37	30	0.76	4.5	1209	2778	1994
LC9976061	X92L035	2	13	10	0.77	31	26	0.90	3.5	1155	2812	1984
WA8649041	-------	2	17	16	1.00	38	34	0.85	2.9	1097	2779	1938
LC9440072	X92L001	2	13	10	0.75	31	27	0.77	4.8	939	2906	1923
Grand Mean		3	13	10	0.82	34	28	0.83	3.6	1293	3217	2255
C.V. (%)										15	9	13
LSD $_{(\alpha=0.05)}$										267	423	274
Planting date:										10/04/01	10/05/01	
Harvest date:										07/29/02	08/19/02	

Pod height was measured at the green pod stage and at harvest Maturity.
Pod height index was determined by dividing the pod height at harvest maturity by the green pod height.
Plant height was measured at the green pod stage and at harvest maturity.
Plant height index was determined by dividing the canopy height at harvest maturity by the total plant height.
Agronomic data are means of three replications at Pullman, WA.
Yield data are means of three replications at Pullman, WA and Genesee, ID.

Table 40. Mean Yields (kg/ha) of Lines in the Advanced Red Cotyledon Winter Lentil Yield Trial, 1998 - 2002

Cultivar	Origin	1998	1999	2000	2001	2002
LC9979062	X92L043	....	....	3636	2321	2736
LC9979065	X92L043	....	....	3361	3089	2699
LC9979010	X92L043	....	....	4118	2646	2657
LC9979016	X92L043	....	....	4244	2710	2613
LC9979120	X92L043	....	....	3996	2260	2293
LC9978094	X92L040	....	....	2509	2282	2248
LC9976079	X92L035	....	....	3232	1751	2207
LC9978028	X92L040	....	....	3733	2315	2195
LC9978057	X92L040	....	....	3277	1983	2084
LC9440070	X92L001	1890	488	2756	2246	2082
LC9440074	X92L001	1516	560	3592	2598	1994
LC9976061	X92L035	....	....	1887	1949	1984
WA8649041	-------	1036	2027	2000	1777	1938
LC9440072	X92L001	1516	727	2812	2391	1923
Grand Mean		1321	559	3063	2223	2255
LSD $_{(\alpha=0.05)}$		244	339	651	467	274

Yield data are means of three replications at Pullman, WA.

Table 41. Agronomic and Yield Data for the Advanced Large and Small Yellow Cotyledon Winter Lentil Yield Trial, 2002 (0242F)

Cultivar	Origin	Pods/ Peduncle	Pod Ht (green)	Pod Ht (mature)	Pod Ht Index	Plant Ht (green)	Plant Ht (mature)	Plant Ht Index	Seed Yld Pullman	Seed Yld Genesee	Seed Yld Mean
			..cm..	..cm..		..cm..	..cm..		..kg/ha..	..kg/ha..	.kg/ha.
LC9977116	X92L039	3	11	8	0.81	27	30	1.10	1597	4005	2801
LC9977019	X92L039	2	12	10	0.93	31	28	0.83	1951	3348	2650
LC9977078	X92L039	3	12	8	0.68	24	20	0.85	1334	3829	2582
WA8649090	-------	3	10	8	0.81	23	22	0.94	1470	3601	2536
LC9977113	X92L039	2	10	7	0.70	24	20	0.91	1177	3858	2518
LC9978013	X92L041	2	11	10	0.88	32	27	0.82	1670	3209	2440
LC9978025	X92L040	3	13	13	1.10	35	31	0.87	1642	3157	2400
LC9979025	X92L043	2	12	11	0.88	30	24	0.84	1629	3096	2363
LC9978003	X92L041	3	15	9	0.47	35	32	0.93	1525	2993	2259
LC9977006	X92L039	3	13	11	0.76	34	28	0.86	1539	2915	2227
LC9977077	X92L039	2	13	11	0.90	29	26	0.87	1466	2901	2184
LC9978036	X92L041	3	12	7	0.59	34	24	0.71	1392	2775	2084
Grand Mean		3	12	9	0.8	30	26	0.88	1533	3307	2420
C.V. (%)		12	12	12	19.4	7	10	14.11	8	7	10
LSD (α=0.05)		0.4	2	2	0.22	3	4	0.17	166	345	241
Planting date:									10/04/01	10/05/01	
Harvest date:									07/29/02	08/19/02	

Pod height was measured at the green pod stage and at harvest Maturity.
Pod height index was determined by dividing the pod height at harvest maturity by the green pod height.
Plant height was measured at the green pod stage and at harvest maturity.
Plant height index was determined by dividing the canopy height at harvest maturity by the total plant height.
Agronomic data are means of three replications at Pullman, WA.
Yield data are means of three replications at Pullman, WA and Genesee, ID.

Table 42. Mean Yields (kg/ha) of Lines in the Advanced Large and Small Yellow Cotyledon Winter Lentil Yield Trial, 1998 - 2002

Cultivar	Origin	1998	1999	2000	2001	2002
LC9977116	X92L039	....	....	4101	2951	2801
LC9977019	X92L039	....	....	4129	2878	2650
LC9977078	X92L039	....	....	3728	2790	2582
WA8649090	-------	2566	851	3908	2926	2536
LC9977113	X92L039	....	....	3594	2770	2518
LC9978013	X92L041	....	....	3489	2101	2440
LC9978025	X92L040	....	....	3356	2523	2400
LC9979025	X92L043	....	....	3249	2517	2363
LC9978003	X92L041	....	....	2957	2281	2259
LC9977006	X92L039	....	....	3172	2281	2227
LC9977077	X92L039	....	....	3295	2331	2184
LC9978036	X92L041	....	....	2988	2112	2084
Grand Mean		1227	834	2957	2385	2420
LSD $_{(\alpha=0.05)}$		308	420	350	387	241

Yield data are means of three replications at Pullman, WA.

Table 43. Agronomic and Yield Data for the Winter Lentil Preliminary Screening Nursery Yield Trial, 2002 (0245F)

Cultivar	Origin	Pods/ Peduncle	Pod Ht (green)	Pod Ht (mature)	Pod Ht Index	Plant Ht (green)	Plant Ht (mature)	Plant Ht Index	Seed Yield
			..cm..	..cm..		..cm..	..cm..		..kg/ha..
LC01601005P	X98L033	3	9	13	1.44	31	27	0.87	2218
LC0160944T	X97L097	2	11	7	0.64	34	26	0.76	1645
LC0160872P	X98L018	3	14	10	0.71	32	26	0.81	1519
LC0160879P	X98L018	3	14	9	0.64	29	29	1.00	1393
LC0160873P	X98L018	3	11	10	0.91	31	29	0.94	1332
LC0160774P	X98L013	2	11	11	1.00	26	24	0.92	934
LC0160768P	X98L013	2	88	8	0.09	23	23	1.00	890
LC0160666E	X98L007	3	8	6	0.75	26	21	0.81	852
LC0160887T	X97L095	3	10	10	1.00	29	24	0.83	842
LC0160641T	X97L084	2	10	8	0.80	28	22	0.79	586
LC0160947T	X97L097	2	12	7	0.58	31	29	0.94	533
LC0160869P	X98L018	2	12	12	1.00	32	28	0.88	385
LC0160957T	X98L025	2	12	6	0.50	35	17	0.49	353
Grand Mean		2	17	9	1	30	25	1	1037

Planting date was 10/04/01. Harvest date was 7/29/02.
Pod height was measured at the green pod stage and at harvest Maturity.
Pod height index was determined by dividing the pod height at harvest maturity by the green pod height.
Plant height was measured at the green pod stage and at harvest maturity.
Plant height index was determined by dividing the canopy height at harvest maturity by the total plant height.
Agronomic data are means of one replication at Pullman, WA.

Table 44. Agronomic and Yield Data for Development of Winter Lentil Production Systems, 2002 (0250F)

Early (10-05-01) and Late (10-29-01) Fall Planting – 2001 - Near Rosalia, WA

Fall Seeding Rate - 120 seed m^2 (41 and 38 kg/ha respectively)

Cultivar	Std. Count Fall	Std. Count Spring	Plant Ht. Green	Plant Ht. Maturity	Plant Ht. Index.	Harvest Index	Mean Yld. Early Fall	Mean Yld. Late Fall	Mean Yield
	..plants/m^2..	..plants/m^2..	..cm..	..cm..			..Kg/ha..	..kg/ha..	..kg/ha..
LC9976079	39	95	31	31	1.00	0.47	1072	1217	1145
LC9979010	42	105	26	25	0.97	0.53	963	1004	984
Mean	41	100	29	28	0.99	0.50	1017	1111	1064
C.V. (%)	62.6	21.8	5.5	6.2	3.8	4.0	13.0	17.2	15.2
LSD $_{(\alpha=0.05)}$	31	13	1	1	0.02	0.01	161	232	100

Yield Interaction of Tall (30 cm) and Short (10 cm) Stubble Height vs. Lentil Line - Early Fall Planting - kg/ha

	LC9976079	LC9979010	LSD $_{(\alpha=0.05)}$ = 227
Tall	1035	1099	
Short	890	1044	

Yield Interaction of Tall (30 cm) and Short (10 cm) Stubble Height vs. Lentil Line - Late Fall Planting - kg/ha

	LC9976079	LC9979010	LSD $_{(\alpha=0.05)}$ = 329
Tall	1001	1193	
Short	1008	1241	

Yield Interaction of Tall and Short Stubble Height vs. Lentil Line - Combined Planting Dates - kg/ha

	LC9976079	LC9979010	LSD $_{(\alpha=0.05)}$ = 141
Tall	1018	1146	
Short	949	1143	

Spring (04-12-02) Planting – 2002 - Near Rosalia, WA

Spring Seeding Rate - 120 seed m^2 (71 and 66 kg/ha respectively)

Cultivar	Plant Ht. Green	Plant Ht. Maturity	Plant Ht. Index	Harvest Index	Mean Yld. Spring
	..cm..	..cm..			..Kg/ha..
Brewer	30	30	0.98	0.49	1013
Richlea	32	32	1.00	0.48	813
Mean	31	31	0.99	0.49	913
C.V. (%)	2.9	6.3	3.9	5.4	9.0
LSD $_{(\alpha=0.05)}$	1	2	0.05	0.03	99

Yield Interaction of Tall (30 cm) and Short (10 cm) Stubble Height vs. Lentil Line - Spring Planting - kg/ha

	Brewer	Richlea	LSD $_{(\alpha=0.05)}$ = 140
Tall	1050	754	
Short	975	872	

Mean Soil Moisture in Percent at Four Depths

	0-30 cm	30-60 cm	60-90 cm	90-120 cm
Fall	14.1	8.4	9.0	11.3
Spring	20.5	18.6	18.1	20.0
Harvest	8.5	9.0	13.0	16.1

Table 44. Agronomic and Yield Data for Development of Winter Lentil Production Systems, 2002 (0250F) Continued 2 of 2

Early(10-05-01) and Late (11-02-01) Fall Planting – 2001 - Near Genesee, ID

Fall Seeding Rate - 120 seed m^2 (41 and 38 kg/ha respectively)

Cultivar	Std. Count Fall	Std. Count Spring	Harvest Index	Mean Yld. Early Fall	Mean Yld. Late Fall	Mean Yield
	..plants/m^2..	..plants/m^2..		..Kg/ha..	..kg/ha..	..kg/ha..
LC9976079	100	108	0.49	3468	2987	3228
LC9979010	88	119	0.50	3883	3302	3593
Mean	94	113	0.50	3676	3145	3411
C.V. (%)	12.8	17.5	7.8	3.0	4.5	5.5
LSD $_{(\alpha=0.05)}$	15	12	0.02	136	173	116

Yield Interaction of Tall and Short Stubble Height vs. Lentil Line - Early Fall (10-05-01) Planting in kg/ha

	LC9976079	LC9979010	LSD $_{(\alpha=0.05)}$ = 192
Tall	3665	4111	
Short	3270	3656	

Yield Interaction of Tall and Short Stubble Height vs. Lentil Line - Late Fall (11-02-01) Planting in kg/ha

	LC9976079	LC9979010	LSD $_{(\alpha=0.05)}$ = 244
Tall	3128	3411	
Short	2845	3193	

Yield Interaction of Tall and Short Stubble Height vs. Lentil Line - Combined Planting Dates in kg/ha

	LC9976079	LC9979010	LSD $_{(\alpha=0.05)}$ = 164
Tall	3397	3761	
Short	3058	3425	

Spring (04-12-02) Planting – 2002 - Near Genesee, ID

Spring Seeding Rate - 120 seed m^2 (71 and 66 kg/ha respectively)

Cultivar	Harvest Index	Mean Yld. Spring
		..Kg/ha..
Brewer	0.52	2756
Richlea	0.49	2191
Mean	0.51	2474
C.V. (%)	3.1	11.8
LSD $_{(\alpha=0.05)}$	0.02	355

Yield Interaction of Tall and Short Stubble Height vs. Lentil Line Spring (04-12-02) Planting in kg/ha

	Brewer	Richlea	LSD $_{(\alpha=0.05)}$ = 503
Tall	2436	2721	
Short	1946	2790	

Mean Soil Moisture in Percent at Four Depths

	0-30 cm	30-60 cm	60-90 cm	90-120 cm
Fall	21.2	12.6	10.3	12.1
Spring	19.9	22.3	19.1	17.4
Harvest	10.6	10.6	10.2	15.6

Table 45. Yield Data in kg/ha of Winter Lentil LC9976079 - Population Study, 2002 (0249F)

Four Sowing Rates – Fall 2001 - Near Rosalia, WA

10-05-01 Planting Date

Rates			Std. Count Fall	Std. Count Spring	Mean Seed Yield.
..multiplier..	..seed/m^2..	..kg/ha..	..plants/m^2..	..plants/m^2..	..kg/ha..
0.5x	60	21	38	64	2785
1.0x	120	41	64	126	2554
1.5x	180	62	115	168	2990
2.0x	240	82	53	195	2116
Mean			68	138	2611
C.V. (%)			19.7	11.0	14.9
LSD (α=0.05)			18	20	535

Four Sowing Rates – Fall 2001 - Near Genesee, ID

10-05-01 Planting Date

Rates			Std. Count Fall	Std. Count Spring	Mean Seed Yield.
..multiplier..	..seed/m^2..	..kg/ha..	..plants/m^2..	..plants/m^2..	..kg/ha..
0.5x	60	21	30	66	2176
1.0x	120	41	94	113	2492
1.5x	180	62	138	127	2446
2.0x	240	82	167	189	2475
Mean			107	124	2397
C.V. (%)			10.5	18.0	5.4
LSD (α=0.05)			15	29	172

Field Evaluation of Lentil Cultivars for Resistance to *Sclerotinia sclerotiorum*:

The relative susceptibility to Sclerotinia white mold for 15 cultivars and one breeding line was evaluated at the Spillman Farm of Washington State University in Pullman, WA. The treatments were arranged in a randomized complete block design with four replications. Each plot was 8 ft square with a 4-ft alley between plots. The soil series of the site is a Palouse (fine-silty, mixed mesic Pachic Ultic Haploxeroll). Entries were double planted in two directions to create a microenvironment favoring development of white mold. The plots were inoculated twice. First inoculation was on 12 June using cold-treated sclerotia recovered from dry pea screenings. The pre-treatment consisted of placing sclerotia inoculum in a 4 C cold room for nine weeks. Four hundred fifty milliliter of the sclerotia was hand spread over each plot. A second inoculation was carried out using colonized oat kernels on 1 July. Two liters of 2-wk old colonized autoclaved oat kernels were thoroughly mixed with greenhouse soil, and the mixture was evenly spread over the plot area (each plot received the same amount of inoculum equivalent to 25 ml colonized oat kernels). Disease severity ratings were taken on 9 July and again on 25 July according to the following 0-to-8 scale: 0 = no infection, 1 = 1-3% infection, 2 = 4-10%, 3 = 10-25%, 4 = 25-50%, 5 = 50-75%, 6 = 75-90%, 7 = 90-97%, and 8 = 97-100%.

Because of the dry summer, white mold disease severity was generally low. Nevertheless, differences among the 16 test entries in response to white mold were observed. Cultivars Athena, Mason, Palouse and Pardina were clearly among the most susceptible cultivars, and should be avoided in fields where white mold is suspected to be a problem. Seven of the tested entries (6 cultivars and one breeding line) showed very little disease and appeared to be relatively resistant to white mold. None of the test entries were immune to white mold.

Table 46. Field Evaluation of Lentil Cultivars for Resistance to *Sclerotinia sclerotiorum.*

Entry	Disease Severity 9 July	Disease Severity 25 July
Palouse	1.25*a	2.50a
Pardina	1.25a	2.25ab
Athena	0.75ab	2.00abc
Mason	1.25a	2.00abc
Brewer	1.00ab	1.75abcd
Crimson	0.50a	1.50bcd
Grandora	0.50a	1.25cd
Merrit	0.50a	1.25cd
Sovereign	0.75ab	1.25cd
Eston	1.00ab	1.00d
LC760209	0.75ab	1.00d
Milestone	1.00ab	1.00d
Pennell	0.75ab	1.00d
Redchief	0.25b	1.00d
Richlea	0.50a	1.00d
Robin	0.25b	1.00d

*Values are means of four replications. Means followed by the same letter in the same column are not significantly different from each other at $P = 0.05$ following a Fisher's protected least significant difference test.

Chickpea Trial Results:

Twenty-two selections and four check varieties were included in the advanced large Kabuli chickpea yield trials conducted at Genesee, ID, Pullman, WA and Walla-Walla, WA in 2002 (Tables 44, 48, and 49). Check varieties included the newly released Sierra as well as Dwelley, Sanford and Evans. Yields at Genesee and Walla-Walla were about normal; however yields at Pullman were somewhat depressed due to the hot and dry season. Overall, the highest yielding and most promising selection was CA9990I604W. This selection is a fern leaf type with cream colored to white seeds and with seed size of 59.4 grams per 100 seeds that is somewhat larger than Dwelley and similar to Sierra. We have begun the seed increase of CA9990I604W and we will continue to increase the seed in the 2003 season. We will need an additional year of data before we can propose this selection for release. Another selection (CA9990I875W) has looked very good in trials over the past two seasons. It has very good resistance to ascochyta blight, good plant height and standing ability as well as a fern leaf structure and excellent seed quality traits, particularly large and white seeds; however, it was only average for yield in 2002. We will continue to test this selection and make a decision on the line after the 2003 season.

Eleven of the entries in the Advanced Trial were Spanish White types and each had large and white seeds. All of the Spanish White selections had a compound leaf structure (fern) as opposed to the simple leaf structure of Dwelley, Sanford and Sierra. Most of these selections had yields that were equal to or better than the checks. Most of the selections had improved blight scores when compared to the four checks. One of the selections (CA9890233W) was increased at Yuma in the winter of 2000-2001 and in the field in 2001 and we now have sufficient seed to possibly make a proposal for a variety release. However, CA9990I875W has superior size and better whiter seeds and possibly could be a better choice for release.

The 2002 preliminary yield trial conducted at Pullman, WA for large Kabuli chickpeas had 22 entries and 4 check lines (Table 50). Check lines included Dwelley, Sanford, Evans and Sierra. Spanish Selections in the Preliminary trial were chosen for large seed size and good resistance to blight. Three of the selections had higher yields when compared to Dwelley and most of the selections also had improved blight scores.

The preliminary screening nursery contained 32 entries of mostly Café types that were being evaluated for the first time (Table 51). The 32 lines were evaluated for plant type, habit, leaf type, and earliness to flower and resistance to Ascochyta blight. The most promising selections will be advanced to the preliminary yield trial that will be planted at Pullman in spring of 2003.

Disease screening:

Recent results of disease screening in the greenhouse has indicated that the newly released variety Sierra has resistance to pathotypes 1 and 2 of the blight pathogen while Dwelley, Sanford and Evans only have resistance to pathotype 1. This finding

explains what appears to be a breakdown of disease resistance of these earlier released varieties and the apparent improved performance of Sierra that appears to have resistance to both pathotypes. Newly introduced germplasm from ICARDA is expected to have resistance to pathotypes 1, 2 and 3 and the incorporation of that germplasm into the breeding program will be important to improved resistance in future selections.

The Ascochyta blight nursery established annually at Spillman Farm continues to be an excellent method of screening for resistance. More than 1800 lines and selections from the breeding program and other sources were screened for resistance in 2002. Infected chickpea debris from infected plants was gathered for use in 2003 to inoculate the nursery. The infected debris is spread among the newly emerging plants in the nursery each spring. Irrigation water is applied to the nursery at regular intervals to ensure good spread of the disease and to promote the pod infection phase. In addition to inoculation using infected plant debris, we also inoculated the trial with laboratory-produced inoculum. That inoculum was prepared from several isolates of the pathogen that representing pathotypes 1 and 2. Scores for infection were made bi-weekly for seven weeks and selections were made based on the blight scores and also on plant habit and pod setting. Chickpea lines with low scores, indicating resistance, were retained for further evaluations while the plant rows with scores exceeding the checks were discarded.

To introduce additional sources of disease resistance, yield traits and quality into the breeding program we evaluated germplasm from several wide ranging sources. These introductions included material from ICARDA in Syria, ICRISAT in India, Turkey, and Mexico as well as from collaborators in Canada and Australia. Germplasm receiving low blight scores indicating good resistance or with improved yield or quality traits were chosen for use as parents in the crossing program.

Selection criteria:

Crosses were made in the field and in the greenhouse to transfer Ascochyta blight resistance to large seeded Spanish White types and to the large seeded Café types. The resulting hybrids are currently being increased in the greenhouse and selected for size, shape and color of the seeds. Advanced single plant selections in the F_4, F_5, and F_6 were grown in the greenhouse and harvested. Seed of these plants will be planted in single plant rows in the blight nursery in 2003 and evaluated for resistance to blight and other traits. The primary criteria in the selection process are large seeds of each type as well as earliness to flower and mature. In addition to the crossing and selection program, Spanish White and Café types were selected from existing breeding populations. Those selections were screened in the blight nursery and evaluated in the preliminary screening nursery.

Early flowering and early maturity:

In addition to the work on resistance to blight, we have identified earlier flowering and earlier maturing germplasm lines. These lines have been crossed and intercrossed to our blight resistant material. The delayed maturity of most of the chickpea varieties appears to be related to late flowering and a high degree of abortion of the first flowers on the plants. This seems related to cold temperature sensitivity in varieties where pod setting is observed to begin only when the mean daily temperature is above a critical point. It also appears that pod setting ceases when mean daily temperatures rise above a critical high temperature point. To alleviate this problem, we are in the process of widening this temperature range of adaptation. Progeny lines are selected for earlier onset of flowering, non-abortion of flowers after the onset of flowering, an extended flowering period, and tolerance to high temperatures during the pod set and seed set stages of development. It is expected as a result of this approach that flower set, pod set and seed development will begin at lower temperatures and continue at higher temperatures. The adaptation allowing widening of the temperature range for flowering, podding, and seed set will advance maturity, improve seed quality and increase yield potential.

Potential Variety Releases:

We have increased the seed of two Spanish White type selections, CA9890233W and CA9990I604W; however, additional data on performance is needed in order to support a release recommendation. Besides these two selections, CA9990I875W has performed well for resistance to blight and for seed quality traits. Based on these observations, we will begin the increase phase of this selection in 2003. We will then have three selections of a Spanish White type to consider for possible release in the coming year. A decision as to which selections to release as a variety will be made in the winter of 2004.

Table 47. Mean Yields (kg/ha) of the Advanced Large Kabuli Chickpea Yield Trial over Locations, 2002 (0281)

Cultivar	Origin	Leaf Type	Seed Type	Genesee	Pullman	Walla Walla	Mean Seed Yield
CA9990I604W	X94C080	C	W	1711	1666	1300	1559
CA9990B1579C	X92C016	S	C	1739	1528	1285	1517
CA9890169W	X94C005	C	W	1647	1683	1104	1478
CA9990B1895C	X94C003	C	C	1646	1547	1120	1438
CA9990B1514C	X92C016	S	C	1630	1435	1167	1411
CA9783165C	X92C017	C	C	1534	1655	1013	1401
CA9783153C	X92C016	S	C	1553	1391	1220	1388
Sierra	X92C016	S	C	1401	1502	1247	1383
CA9990I861W	X94C005	C	W	1750	1543	852	1382
CA9990I827W	X94C005	C	W	1444	1431	1247	1374
Dwelley	X88C003	S	C	1465	1401	1214	1360
CA9890239W	X94C005	C	W	1592	1586	892	1357
CA9990B1897C	X94C003	C	C	1496	1547	1019	1354
CA9783163C	X92C017	C	C	1693	1507	794	1331
CA9990I875W	X94C005	C	W	1569	1533	799	1300
CA9890233W	X94C005	C	W	1478	1572	659	1236
CA9990I869W	X94C005	C	W	1565	1435	704	1235
CA9890234W	X94C005	C	W	1576	1361	703	1213
CA9990B2093C	X96C128	S	C	1452	1154	1012	1206
CA9890235W	X94C005	C	W	1534	1443	620	1199
CA9990B2132C	X96C128	S	C	1356	1353	865	1191
Sanford	X88C003	S	C	1452	1229	863	1181
CA9783069C	X92C016	S	C	1212	1298	1025	1178
Evans	X88C003	S	C	1332	1209	926	1156
CA9783180C	X92C019	C	C	1468	1170	781	1140
CA9990B2468W	X97C002	C	W	1241	1116	650	1002
Grand Mean				1521	1435	965	1307
C.V. (%)				8	7	20	19
LSD $_{(\alpha=0.05)}$				175	134	269	336
Planting Date				4/22/2002	4/24/2002	4/25/2002	
Harvest Date				8/27/2002	9/3/2002	8/26/2002	

Leaf type; C = compound leaf, S = simple leaf type
Seed type; W = white seed type, C = café seed type
Yield data are means of three replications at each location.

Table 48. Agronomic Data for the Advanced Large Kabuli Chickpea Yield Trial, 2002 (0281)

Cultivar	Origin	Leaf Type	Seed Type	Days to Flower	Pod Ht (green)	Plant Ht (Green)	Weight 100 Seed	Ascochyta Blight
					..cm..	..cm..	..g..	
CA9990I604W	X94C080	C	W	62	29	39	59.4	4
CA9990B1579C	X92C016	S	C	64	26	42	56.2	4
CA9890169W	X94C005	C	W	62	27	38	58.2	4
CA9990B1895C	X94C003	C	C	64	28	48	46.3	3
CA9990B1514C	X92C016	S	C	64	26	43	58.6	4
CA9783165C	X92C017	C	C	65	31	40	58.5	4
CA9783153C	X92C016	S	C	64	31	44	55.6	4
Sierra	X92C016	S	C	63	30	40	55.9	4
CA9990I861W	X94C005	C	W	63	24	39	57.1	4
CA9990I827W	X94C005	C	W	63	28	38	59.9	4
Dwelley	X88C003	S	C	64	33	40	56.9	5
CA9890239W	X94C005	C	W	63	34	44	60.7	3
CA9990B1897C	X94C003	C	C	68	34	44	45.3	3
CA9783163C	X92C017	C	C	64	28	40	59.0	4
CA9990I875W	X94C005	C	W	62	31	38	63.4	4
CA9890233W	X94C005	C	W	62	28	38	58.9	3
CA9990I869W	X94C005	C	W	62	24	37	60.3	4
CA9890234W	X94C005	C	W	62	33	36	59.8	3
CA9990B2093C	X96C128	S	C	68	30	44	52.3	5
CA9890235W	X94C005	C	W	62	32	40	59.6	4
CA9990B2132C	X96C128	S	C	65	32	46	53.1	5
Sanford	X88C003	S	C	65	36	46	49.1	5
CA9783069C	X92C016	S	C	66	29	44	61.6	5
Evans	X88C003	S	C	65	31	44	48.0	5
CA9783180C	X92C019	C	C	64	32	45	61.4	4
CA9990B2468W	X97C002	C	W	61	28	46	54.6	5
Grand Mean				64	30	42	56.5	4
C.V. (%)				2	11	7		9
LSD (α=0.05)				2	4	4		1

Leaf type; C = compound leaf, S = simple leaf type.

Seed type; W = white seed type, C = café seed type.

Pod height was measured at the green pod stage.

Plant height was measured at the green pod stage.

Ascochyta Blight Resistance Scores: 1 = Highly Resistant, 3 = Resistant, 5 = Tolerant, 7 = Susceptible and 9 = Highly Susceptible

Agronomic data are means of three replications at Pullman, WA.

Table 49. Mean Yields (kg/ha) of Chickpea Lines in the Advanced Large Kabuli Chickpea Yield Trial, 1999 - 2002

Cultivar	Origin	Leaf Type	Seed Type	1999	2000	2001	2002
CA9990I604W	X94C080	C	W	....	....	....	1559
CA9990B1579C	X92C016	S	C	....	....	....	1517
CA9890169W	X94C005	C	W	....	....	1647	1478
CA9990B1895C	X94C003	C	C	....	....	....	1438
CA9990B1514C	X92C016	S	C	....	....	....	1411
CA9783165C	X92C017	C	C	1601	1782	1745	1401
CA9783153C	X92C016	S	C	1082	1781	1754	1388
Sierra	X92C016	S	C	1167	1761	1731	1383
CA9990I861W	X94C005	C	W	....	....	....	1382
CA9990I827W	X94C005	C	W	....	....	....	1374
Dwelley	X88C003	S	C	1053	1701	1595	1360
CA9890239W	X94C005	C	W	....	....	1739	1357
CA9990B1897C	X94C003	C	C	....	....	....	1354
CA9783163C	X92C017	C	C	...	1875	1855	1331
CA9990I875W	X94C005	C	W	....	....	....	1300
CA9890233W	X94C005	C	W	....	....	1788	1236
CA9990I869W	X94C005	C	W	....	....	....	1235
CA9890234W	X94C005	C	W	....	....	1807	1213
CA9990B2093C	X96C128	S	C	....	....	....	1206
CA9890235W	X94C005	C	W	....	....	1792	1199
CA9990B2132C	X96C128	S	C	....	....	....	1191
Sanford	X88C003	S	C	957	1503	1545	1181
CA9783069C	X92C016	S	C	908	1464	1567	1178
Evans	X88C003	S	C	956	1467	1636	1156
CA9783180C	X92C019	C	C	....	1649	1555	1140
CA9990B2468W	X97C002	C	W	....	....	....	1002
Grand Mean				978	1555	1784	1307
LSD $_{(\alpha=0.05)}$				137	176	140	336

Leaf type; C = compound leaf, S = simple leaf type.
Seed type; W = white seed type, c = café seed type.
2002, 2001, 2000 Yield data are means of three replications at each location, over three locations.
1999 Yield data are means of three replications at each location, over two locations

Table 50. Agronomic Data for the Preliminary Large Kabuli Chickpea Yield Trial, 2002 (0283)

Cultivar	Origin	Leaf Type	Seed Type	Days to Flower	Weight 100 Seed	Ascochyta Blight	Mean Seed Yield
					..g..		..kg/ha..
CA0090B383C	X96C019	S	C	63	39.4	4	1432
CA0090B442C	X96C128	S	C	69	57.3	5	1365
CA0090B454C	X96C128	S	C	67	47.7	4	1364
Dwelley	X88C003	S	C	66	57.1	5	1345
CA0090B347C	X96C004	S	C	61	49.4	4	1327
CA0090B003W	X94C005	C	W	62	56.3	5	1326
CA0090B015W	X94C005	C	W	63	52.0	4	1304
Sanford	X88C003	S	C	66	49.7	5	1294
CA0090B304C	X95C012	S	C	68	49.3	5	1290
CA0090B309C	X95C012	S	C	65	55.1	5	1282
CA0090B300C	X95C012	S	C	69	48.5	6	1277
Sierra	X92C016	S	C	63	53.1	4	1271
CA0090B298C	X95C012	S	C	68	53.5	5	1245
CA0090B344C	X96C004	S	C	60	52.9	4	1178
CA0090B039W	X96C140	C	W	61	56.9	5	1177
CA0090B202W	X98C024	S	W	63	39.5	4	1166
CA0090B550C	X96C012	S	C	63	47.5	4	1119
CA0090B640C	X96C023	S	C	65	47.3	5	1110
Evans	X88C003	S		63	48.1	5	1095
CA0090B135W	X98C012	S	W	64	51.0	4	1069
CA0090B392C	X96C019	S	C	64	44.7	4	1062
CA0090B659C	X96C026	S	C	65	31.3	4	1060
CA0090B643C	X96C023	S	C	64	45.7	5	1042
CA0090B457C	X96C128	S	C	66	59.0	4	1024
CA0090B045W	X96C142	C	W	62	51.1	5	926
CA0090B292C	X95C012	S	C	67	52.6	4	923
Grand Mean				65	49.8	5	1195
C.V. (%)				2		10	6
LSD (α=0.05)				2		1	100

CA0090B015W	Genesee	Pullman	Walla Walla	Grand Mean
Mean Seed Yield	1159	1304	415	959
Planting Date	8/27/2002	4/24/2002	4/25/2002	
Harvest Date	4/22/2002	9/3/2002	8/26/2002	

Pullman planting date was 4/24/2002. Pullman harvest date was 9/3/2002.

Leaf type; C = compound leaf, S = simple leaf type. Seed type; W = white seed type, C = café seed type.

Ascochyta Blight Resistance Scores: 1 = Highly Resistant, 3 = Resistant, 5 = Tolerant, 7 = Susceptible and 9 = Highly Susceptible

Agronomic data are means of three replications at Pullman, WA. Yield data for CA0090B015W are means of three replications at each location.

Table 51. Agronomic Data for the Preliminary Large White Kabuli Chickpea Screening Nursery, 2002 (0285)

Cultivar	Origin	Leaf Type	Seed Type	Days to Flower	Weight 100 Seed	Ascochyta Blight	Mean Seed Yield
					..g..		..kg/ha..
CA0190B773C	X96C020	S	C	63	49.3	4	1836
CA0190B775C	X96C020	C	C	62	47.7	3	1791
CA0190B015C	X95C012	C	C	66	48.0	3	1740
CA0190B052C	X96C003	C	C	62	42.1	3	1535
CA0190B418C	X96C020	S	C	62	48.9	4	1534
CA0190B572C	X98C010	C	C	63	39.5	3	1499
CA0190B110C	X96C004	C	C	63	35.3	2	1485
CA0190B449C	X96C024	S	C	65	59.0	5	1480
CA0190B723C	X96C011	S	C	63	42.8	4	1425
CA0190B559C	X98C010	S	C	69	44.3	3	1422
CA0190B422C	X96C022	S/C	C	63	42.6	4	1352
CA0190B295C	X96C006	S	C	64	45.3	4	1337
CA0190B777C	X96C020	C	C	62	45.5	3	1324
CA0190B405C	X96C020	S/C	C	63	49.1	4	1268
CA0190B608C	X98C016	S	C	69	44.5	4	1219
CA0190B539C	X96C144	C	C	66	43.9	4	1218
CA0190B232C	X96C128	S	C	66	54.7	5	1212
CA0190B004C	X95C012	S	C	69	51.2	4	1200
CA0190B549C	X98C010	C	C	64	35.7	3	1165
CA0190B677C	X98C024	C	C	63	55.6	4	1092
CA0190B300C	X96C007	S	C	62	40.8	4	1041
CA0190B474C	X96C036	C	C	65	39.5	3	1038
CA0190B238C	X96C128	S	C	65	52.0	5	998
CA0190B002C	X95C012	S	C	70	49.6	3	993
CA0190B598C	X98C012	C	C	63	52.7	3	988
CA0190B233C	X96C128	S	C	69	55.0	5	965
CA0190B783C	X96C023	S	C	63	43.4	4	879
CA0190B024C	X95C012	S	C	70	54.6	4	873
CA0190B839C	X96C031	S	C	66	57.6	4	700
CA0190B253C	X96C128	S	C	65	49.4	4	617
CA0190B249C	X96C128	S	C	69	48.5	4	436
CA0190B473C	X96C036	S	C	65	46.1	4	415
Grand Mean				65	47.3	4	1190

Planting date was 4/24/2002. Harvest date was 9/3/2002.

Leaf type; C = compound leaf, S = simple leaf type.

Seed type; W = white seed type, C = café seed type.

Ascochyta Blight Resistance Scores: 1 = Highly Resistant, 3 = Resistant, 5 = Tolerant, 7 = Susceptible and 9 = Highly Susceptible

Agronomic data are means of one replication at Pullman, WA.

Table 52. Agronomic Data for the Canadian and Australian Chickpea Observation Nursery, 2002 (0207C)

Cultivar	Weight 100 Seed	Seed Yield
	...g..	..kg/ha...
FLIP94-90C	33.2	1644
S95342	40.1	1435
CDC-Xena	51.1	1426
CDC-Diva	52.6	1331
CDC-Yuma	47.5	1283
FLIP94-92C	40.0	1221
CDC-Anna	20.0	1210
92073-40	27.8	1200
S95362	34.5	1194
BS1-43	23.6	1192
CDC-Nika	31.4	1173
CDC-Chichi	40.2	1168
CDC-Chico	25.5	1122
ICCV96836	18.6	1118
SONA*98CZH4009	22.5	1118
FLIP-94508C	18.4	1058
SONA*98PBC4019	23.3	1056
CDC-Desiray	19.7	936
SB2000-2	16.4	720
Barwon-MR	14.6	707
SONA-4028	….	
Grand Mean	30.1	1227

Agronomic data and yield are means of one replication at Pullman, WA.

Field evaluation of chemicals in controlling chickpea Ascochyta blight:

The effectiveness of five chemicals (four fungicides and one laboratory chemical) in controlling Ascochyta blight of chickpea was evaluated at two locations. The five chemicals and their applied full rates were BAS500 00F (10.4 fl oz/A), Bravo Weather Stik (1.4 pt/A), Quadris SC (9.2 fl oz/A), Tilt (4 fl oz/A), and salicylic acid (4.2 oz/A, 10 mM in 0.01% Silwet L-77 from Lehle Seeds, Round Rock, TX). These chemicals were applied either at the full rate or at a half rate, and each of the rates was applied either once or twice on two chickpea cultivars Dwelley (resistant) and Spanish White (susceptible) with four replications. Water was sprayed as a control. The split plots were arranged with a randomized complete block design with chemicals on main plots and cultivars on split plots, and the main plot size was 8 ft wide by 10 ft long with 4 ft alley between plots. The same experimental design and plot size were used at the Spillman Experimental Farm of Washington State University in Pullman, WA and on a farm near Genesee, ID. Fields at both locations had been planted to chickpeas previously and inoculum of *Ascochyta rabiei* was abundant. Both locations were sprayed on 20 Jun, and for plots sprayed twice on 5 Jul. Disease severity data were recorded on three dates on each location, 24 Jun, 9 Jul and 24 Jul for the Pullman location and 26 Jun, 12 Jul and 24 Jul for the Genesee location. Disease severity was recorded based on a 1-to-9 scale: 1 = no lesions visible, no signs of disease, healthy plants; 2 = lesions visible but must look closely at the plants to see them; 3 = A few lesions visible, can be seen easily; 4 = many lesions visible, but lesions have not caused irreparable damage to the plants; 5 = large lesions on stems or leaves, some stem girding; 6 = Many large lesions on stems and leaves, moderate stem girding and breakage; 7 = many large lesions on stems and leaves, stem girding and breakage common; 8 = Most of the plants died, only few green leaves left; 9 = plants completely died, virtually no greens left. Two center rows of each split plot were harvested on 6 Sep. After drying plants were threshed and yield data were taken as ounces per harvested area (20 sq ft).

Ascochyta blight was clearly visible at both locations on 20 Jun, and disease pressure was higher at the Pullman location than at the Genesee location. The first disease rating conducted on 24-26 Jun showed obvious cultivar differences, but no chemical differences. Subsequent disease ratings and yield data showed differences between cultivars and among chemicals at both locations. No differences between number of applications (once versus twice) were observed except for the third (24 Jul) disease rating and yields on the Genesee location only. Application rates (full rate versus half rate) did not show any significant difference except for the third (24 Jul) disease rating on the Genesee location only. Data of both application rates and times of application for each chemical are pooled and considered as one treatment in the analysis. In summary, chemical sprays on the resistant cultivar Dwelley did not improve disease control or yield except for the third (24 Jul) disease rating on Genesee location only. On the susceptible cultivar Spanish White, significant differences were observed among the chemicals in disease ratings and yield. The fungicides Headline, Quadris and Bravo were effective in controlling Ascochyta blight on chickpea. The fungicide Tilt and the chemical salicylic acid showed no effect against Ascochyta blight.

Table 53.

Pullman location	Dwelley (Resistant) Disease severity 24 Jun	9 Jul	24 Jul	Yield**	Spanish White (Susceptible) Disease severity 24 Jun	9 Jul	24 Jul	Yield**
BAS500 00F (10.4 or 5.2 fl oz)	4.4a*	3.5a	4.3a	10.6a	7.1a	7.7a	7.5a	3.1a
Quadris (9.2 or 4.6 fl oz)	4.5a	3.6a	4.1a	8.6a	7.0a	8.1ab	7.9ab	2.2ab
Bravo Weather Stik (1.4 or 0.7 pt)	4.6a	3.6a	4.0a	11.8a	7.0a	8.1ab	7.8ab	2.6a
Tilt (4 or 2 fl oz)	4.5a	4.1a	4.3a	9.2a	6.9a	8.3ab	8.2ab	1.6ab
Salicylic acid (4.2 or 2.1 oz in 0.01% Silwet L-77	4.7a	4.3a	4.9a	9.0a	7.3a	8.8b	8.7ab	0.5b
Control	4.3a	4.1a	4.7a	8.5a	7.1a	8.8b	8.8b	0.5b

Genesee location	Dwelley (Resistant) Disease severity 26 Jun	12 Jul	24 Jul	Yield**	Spanish White (Susceptible) Disease severity 26 Jun	12 Jul	24 Jul	Yield**
BAS500 00F (10.4 or 5.2 fl oz)	3.3a*	3.2a	2.6a	9.5a	5.6a	5.6a	5.8a	4.9a
Quadris (9.2 or 4.6 fl oz)	3.8a	3.6a	2.8ab	10.3a	5.6a	6.3b	6.3ab	3.4b
Bravo Weather Stik (1.4 or 0.7 pt)	3.7a	3.4a	3.2ab	9.7a	5.8a	6.4b	6.8bc	3.1b
Tilt (4 or 2 fl oz)	3.6a	3.5a	3.5bc	9.4a	5.7a	6.9c	7.4cd	1.4c
Salicylic acid (4.2 or 2.1 oz in 0.01% Silwet L-77	3.5a	3.8a	3.8c	9.7a	5.7a	7.2c	7.6d	1.0c
Control	3.7a	3.6a	3.9c	9.5a	5.7a	7.2c	7.8d	0.8c

*Values are means of 16 plots (four replications each of two application rates and two application times). Means followed by the same letter in the same column in same location are not significantly different at P = 0.05 following a Fisher's protected least significant difference test.
**Yields are expressed as ounces per harvested area (20 sq ft).

Table 54. Fungicide Seed Treatment Evaluation Control of Ascochyta Blight on Dwelley Chickpea from Rimrock Area, Nez Perce County, 2002.
Data from Larry Smith, University of Idaho Cooperative Extension.

Seed Yield Pounds per Acre					
Seed Treatment	Rep 1	Rep 2	Rep 3	Rep 4	Average
1-- Maxim + Apron XL + Water + Colorant	922	1117	1096	1481	1138
2- Maxim + Apron XL + Water + Colorant + AZO	966	1101	1357	1275	1175
3- Maxim + Apron XL + Water + Colorant + Cruiser	1223	1084	1387	1636	1330
4- Maxim + Apron XL + Water + Colorant	1022	1108	1489	1313	1233
5- Untreated Check	1123	1036	1067	1352	1145
Average	1051	1089	1277	1399	1204

LSD Summary for Seed Yield			
Seed Treatment	Average Seed Yield		
	pounds/acre		
3- Maxim + Apron XL + Water + Colorant + Cruiser Insecticide	1330	A	
4- Maxim + Apron XL + Water + Colorant	1233	A	B
2- Maxim + Apron XL + Water + Colorant + AZO	1175	A	B
5- Untreated Check	1145		B
1- Maxim + Apron XL + Water + Colorant	1138		B
L.S.D. (10%) = 150 lbs	C.V. = 10.21%		

Results:
The seed treatment combination, number 3, Maxim + Apron XL + Water + Colorant + Cruiser provided significantly better seed yield (10% significance level) than the seed treatment combination standard treatment of Maxim + Apron XL + Water + Colorant and the untreated check. Additionally, although not significant, the highest application rate of maxim provided the second highest average seed yield per acre.

Comments:
The fungicidal seed treatment combination, number 3, Maxim + Apron XL + Water + Colorant + Cruiser Insecticide provided the highest seed yield and was the only treatment containing Cruiser, a systemic insecticide.

These results warrant further on-farm evaluation of Cruiser as an additional component to standard chickpea fungicidal seed treatment regimes in north central Idaho. Moreover, the result of this on-farm test supports the continued use of seed treatment combinations to improve the seed yield of chickpea crops in north central Idaho.

Lupin Evaluations:

The variety evaluation for lupin included 30 lines (Table 55). Two of the lines (V8-4 and V12) flowered late and no seed yield could be recorded.

The line P12-1 was the highest yielding line in this trial. Available soil moisture appeared to limit all lines from producing high yields. Lupin may have promise as a feed legume crop for the drier areas of the Pacific Northwest. Available soil moisture will limit where the lupin can be grown as an economically viable crop.

Table 55. Agronomic Data for the Advanced Lupin Yield Trial, 2002 (0292)

Cultivar	Days to First Flower	Plant Ht Maturity	Stand Count	Weight 100 Seed	Mean Seed Yield
		…cm…	..plants/m^2..	…g…	…kg/ha…
P12-1	47	36	41	14.0	837
F6-RF	47	41	36	13.6	675
G52	50	41	39	13.3	628
E1	49	39	31	13.4	613
E33	49	40	27	11.6	588
F8-8RF	47	46	36	14.8	579
Danja	47	40	24	15.0	547
Quilinock	47	35	26	14.0	544
E8	47	39	39	13.6	503
E32-2	47	38	38	10.8	486
W12WS	52	48	40	14.1	452
Yorrel	47	38	25	16.1	415
E30	48	38	34	12.6	400
E6	50	38	28	13.0	398
G6-9	50	40	38	9.3	390
F7-7	45	43	44	13.4	384
Prima	47	32	21	15.4	382
GB-69	47	39	25	14.8	368
G24	47	40	43	14.4	352
HP39	51	39	32	10.9	316
Belara	47	29	26	12.9	294
G28	47	37	32	15.9	285
Gungurru	47	28	29	15.1	283
G12-12	47	44	39	14.6	259
Tallerack	48	34	28	17.5	245
E2-2	47	40	37	10.8	230
G16-3	46	34	50	14.6	180
G10-7	47	38	42	14.9	46
V8-4	70	52	28	----	----
V12	69	39	30	----	----
Grand Mean	49	39	34	13.7	413
C.V. (%)	1	7	16		15
LSD$_{(\alpha=0.05)}$	1	4	8		83

Planting date 5/15/02 Plots were sown at a rate of 54 seed m^2.

Harvest date 9/4/02.

Lines V8-4 and V12 were not harvested as they did not flower.

Yield data are means of three replications at Pullman, WA.

Western Regional

Dry Pea, Lentil and Chickpea Yield Trials

Table 56. Combined green pea performance data for Nezperce and Moscow, ID 2002.
Data from Ying Wu and Stephen Guy, University of Idaho.

Variety or Selection	Seed Yield			Seed Weight			Vine Length	Canopy Height
	Nezperce	Moscow	Average	Nezperce	Moscow	Average		
	----------lb/acre----------			----------g/100----------			inches	inches
Ariel	1356	2588	1972	14.5	19.2	16.9	25	25
Bluebird	2009	4156	3083	18.0	23.6	20.8	23	23
Columbia	1597	2778	2188	15.7	19.3	17.5	45	20
Cruiser	1427	2943	2185	15.6	21.1	18.4	26	26
Franklin	1419	2347	1883	17.0	21.2	19.1	26	16
Hero	1124	2567	1846	18.0	24.1	21.1	21	21
Joel	1596	2737	2167	16.8	18.8	17.8	41	18
Journey	1368	2751	2060	12.4	16.3	14.4	47	20
Karita	1367	2857	2112	20.6	25.9	23.3	25	25
Lifter	1359	2965	2162	15.8	22.0	18.9	30	16
Supra	1034	2255	1645	29.0	31.6	30.3	24	24
Toledo	1674	3456	2565	21.1	26.6	23.9	27	27
Pro 98106	2004	2743	2374	17.8	20.3	19.1	21	21
PS 610512	1795	3162	2479	16.9	20.5	18.7	24	24
PS 610324	1370	2341	1856	18.5	23.6	21.1	26	26
Ceb 1170	1618	3361	2490	21.7	27.5	24.6	28	28
Ceb 1171	1833	3762	2798	18.6	24.4	21.5	24	24
Average	1526	2928	2227	18.1	22.7	20.4	28	22
LSD (0.10)	184	301	172	1.2	2.4	1.3	2	2
CV (%)	10	8	--	5.3	8.9	--	--	--

Table 57. Combined yellow pea performance data for Nezperce and Moscow, ID 2002.
Data from Ying Wu and Stephen Guy, University of Idaho.

Variety or Selection	Seed Yield			Seed Weight			Vine Length	Canopy Height
	Nezperce	Moscow	Average	Nezperce	Moscow	Average		
	----------lb/acre----------			----------g/100----------			inches	inches
Athos	1442	2886	2164	23.1	26.9	25.0	19	19
Badminton	1655	3313	2484	16.7	23.1	19.9	22	22
Eiffel	1783	3044	2414	20.6	26.1	23.4	27	27
Fallon	1625	2892	2259	19.6	24.8	22.2	25	24
Jasmin	1143	2958	2051	19.4	26.1	22.8	28	28
Midas	1804	3630	2717	15.6	20.6	18.1	28	28
Rex	1388	3246	2317	19.7	25.3	22.5	29	22
Shawnee	1682	2678	2180	17.7	19.0	18.4	41	16
Swing	1986	3662	2824	18.4	21.3	19.9	27	27
Universal	1785	3107	2446	17.6	21.5	19.6	28	28
PS 810765	1868	3517	2693	20.8	25.0	22.9	24	23
Ceb 1484	1792	3886	2839	17.4	23.5	20.5	24	24
Ceb 1489	2273	4146	3210	18.5	22.7	20.6	24	24
Average	1710	3305	2507	18.9	23.5	21.2	26	24
LSD (0.10)	184	301	172	1.2	2.4	1.3	2	2
CV (%)	10	8	--	5.3	8.9	--	--	--

Table 58. Seed yield averages for green and yellow peas tested for three years in northern Idaho. Data from Ying Wu and Stephen Guy, University of Idaho.

Variety or Selection	2000	2001	2002	Average
	----------lb/acre----------			
Green pea				
Ariel	1863	2290	1972	2042
Columbia	1638	2432	2188	2086
Cruiser	1656	2466	2185	2102
Franklin	2507	1845	1883	2078
Hero	1735	1964	1846	1848
Joel	2078	2443	2167	2229
Karita	2259	2680	2112	2350
Lifter	2168	1879	2162	2070
Supra	1785	2374	1645	1935
Toledo	1830	2697	2565	2364
PS 610324	2180	2330	1856	2122
Average	1973	2309	2053	2112
LSD (0.10)	114	171	172	--
Yellow pea				
Athos	2340	2706	2164	2403
Badminton	2070	2566	2484	2373
Fallon	1810	2314	2259	2128
Jasmin	1964	2476	2051	2164
Rex	1960	2832	2317	2370
Shawnee	2613	2601	2180	2465
Swing	2295	2637	2824	2585
Average	2150	2590	2326	2355
LSD (0.10)	114	171	172	--

Table 59. Spring lentil performance data for Nezperce and Moscow, ID 2002.
Data from Ying Wu and Stephen Guy, University of Idaho.

Variety or	Seed Yield			Seed Weight			Plant Height		
Selection	Nezperce	Moscow	Average	Nezperce	Moscow	Average	Nezperce	Moscow	Average
	----------lb/acre----------			----------g/100----------			----------inches----------		
Brewer	650	2390	1520	5.4	5.6	5.5	15	17	16
Crimson	430	2380	1410	2.7	3.3	3.0	12	16	14
Eston	490	2540	1520	2.6	3.3	3.0	13	18	16
Mason	560	2630	1600	5.3	6.6	6.0	13	16	15
Merrit	690	2420	1560	5.4	6.1	5.8	14	17	16
Pardina	750	2630	1690	3.3	3.9	3.6	12	16	14
Pennel	700	2480	1590	5.7	6.8	6.3	14	18	16
Richlea	510	2560	1540	4.2	4.9	4.6	14	18	16
LC 860359L	570	2460	1520	5.6	6.9	6.3	16	18	17
LC 860616L	670	2480	1580	6.7	6.9	6.8	15	19	17
LC 760209L	570	2210	1390	6.6	6.9	6.8	14	16	15
LC 99602427P	580	2550	1570	4.0	4.5	4.3	11	15	13
LC 99602411E	710	2530	1620	3.6	4.2	3.9	12	17	15
LC 99602972T	410	1990	1200	3.2	3.8	3.5	11	15	13
Average	590	2450	1520	4.6	5.3	4.9	13	17	15
LSD (0.10)	100	170	100	0.4	0.3	0.3	1	1	1
CV (%)	15	6	--	6.6	4.4	--	7	6	--

Table 60. Spring chickpea performance data for Moscow, ID 2002.
Data from Ying Wu and Stephen Guy, University of Idaho.

Variety or Selection	Seed Yield	Seed Weight	Plant Height
	lb/acre	g/100	inches
Dwelley	2070	52.8	23
Evans	1870	43.0	23
Myles	2180	19.3	19
Sanford	1750	44.2	24
Sarah	1840	16.5	15
Sierra	2420	54.7	20
Spanish White	2050	55.8	17
UC 27	2520	42.6	18
CA 9890233W	2530	54.4	18
CA 99901604C	2560	54.1	19
Average	2180	43.7	20
LSD (0.10)	200	1.6	1
CV (%)	8	3.1	6

Table 61. Seed yield for lentil and chickpea varieties tested for three years in northern Idaho. Data from Ying Wu and Stephen Guy, University of Idaho.

Variety or Selection	2000	2001	2002	Average
	----------lb/acre----------			
Lentil				
Brewer	1859	2374	1522	1918
Crimson	1493	1921	1407	1607
Eston	1434	2259	1516	1736
Mason	1773	2000	1594	1789
Merrit	1891	2468	1557	1972
Pardina	1834	2299	1688	1940
Richlea	1580	2301	1532	1804
Average	1695	2232	1545	1824
LSD (0.10)	81	120	95	--
Chickpea				
Dwelley	1092	2094	2070	1752
Evans	1125	2173	1870	1723
Myles	1206	2517	2180	1968
Sanford	1162	2225	1750	1712
Sarah	978	2600	1840	1806
Sierra	1019	2361	2420	1933
Spanish White	999	2184	2050	1744
UC 27	995	2710	2520	2075
Average	1072	2358	2088	1839
LSD (0.10)	166	195	200	--

Table 62. Western Regional Dry Pea Line Evaluation – Mosccasin Summary. – Exp. 810702. Central Agricultural Research Center, Moccasin, MT 2002.
Data from Karnes Neil and David Wichman, Montana State University.

Variety	Physiological Date	Physiological Height	Vine	Harvest Height	Stand Index	Grain Harvest Yield	Size	Test	Moisture
	(days)[1/]	---------- (in) ----------			(ht_h/vine)	(lbs/acre)	(g/1,000)	(lbs/bu)	(%)
PS810765	93 [a]	14.4	17.3	12.8	0.738	2,260 [a]	**272.9** [a]	63.52 [a]	14.7 [a]
PS610152	98	13.8	16.1	13.8	0.857	2,038	216.0	62.95	14.7 [a]
Lifter	97	9.5	21.0	9.0	0.430	1,800	223.0	63.77 [a]	12.2
PS610324	96	14.4	16.4	15.8	**0.963** [a]	1,740	252.4	61.92	14.0
CDC Mozart	94	14.4	16.4	14.8	0.903 [a]	**2,545** [a]	224.9	63.50 [a]	14.7 [a]
Eclipse	92 [a]	16.1	17.9	15.9	0.887 [a]	2,468 [a]	243.0	**63.90** [a]	14.8 [a]
CDC Handel	92 [a]	17.0 [a]	19.8	16.0	0.810	2,306 [a]	198.0	63.15	**15.0** [a]
Swing	**91** [a]	17.3 [a]	19.4	17.3 [a]	0.892 [a]	2,212 [a]	240.5	62.47	14.2
Cruiser	94	16.0	18.4	16.6 [a]	0.904 [a]	2,017	214.4	61.55	14.2 [a]
Espace	95	16.4 [a]	18.4	17.4 [a]	0.947 [a]	1,974	221.9	63.77 [a]	14.9 [a]
Majoret	97	17.1 [a]	19.0	17.3 [a]	0.908 [a]	1,921	244.6	63.42 [a]	14.6 [a]
Granger	102	16.8 [a]	**34.5** [a]	11.8	0.346	1,849	142.9	63.60 [a]	14.0
Toledo	95	**17.8** [a]	20.3	**17.9** [a]	0.885 [a]	1,816	272.1 [a]	60.25	14.2 [a]
Trapper	97	11.8	33.5 [a]	9.5	0.285	1,651	127.6	62.95	13.9
Means	95	15.2	20.6	14.7	0.768	2,043	221.0	62.91	14.3
LSD (0.05 by t)	2	1.4	2.1	1.7	0.091	491	8.8	0.53	0.8
C.V.% (s/means)	1.23	6.54	6.97	8.05	8.30	16.8	2.8	0.59	3.83

[a] - Denotes values equal to highest value (in **bold**) based on $LSD_{(0.05)}$.

Table 63. Western Regional Lentil Trial – Moccasin Summary – Exp. 860702. Central Agricultural Research Center, Moccasin, MT 2002. Data from Karnes Neil and David Wichman, Montana State University.

Variety	Physiological Date		Physiological Height		Harvest Height		Stand Index	Grain Harvest Yield		Grain Harvest Size		Grain Harvest Test	Grain Harvest Moisture	
	(days)[1/]		---------- (in) ----------				(ht_h/vine)	(lbs/acre)		(g/1,000)		(lbs/bu)	(%)	
LC860359L	99.1		11.1	a	11.7	a	0.836	1,887	a	76.8		59.0	17.4	a
LC7601393L	95.0		11.0	a	10.8		0.846	1,865	a	67.9		58.2	16.4	
LC860616L	94.5		11.3	a	11.3		0.834	1,833	a	**79.8**	a	57.3	16.8	
Laird	97.5		**12.0**	a	**12.4**	a	0.890	1,739	a	67.6		58.6	16.5	
CDC Glamis	99.5		11.8	a	12.3	a	0.855	1,691		70.0		58.0	**17.5**	a
Pennell	95.0		10.0		10.1		0.871	1,572		73.0		57.7	16.4	
Merritt	**93.0**	a	11.3	a	10.4		**0.899**	1,897	a	68.7		58.1	16.1	
Brewer	93.5	a	10.0		10.0		0.536	1,644		61.7		58.8	16.1	
LC760209C	94.0		11.0	a	11.1		0.843	**1,900**	a	77.6		57.4	16.2	
CDC Vantage	94.5		11.8	a	11.4		0.857	1,848	a	58.0		61.2	16.3	
CDC Richlea	96.5		11.0	a	10.9		0.812	1,812	a	57.4		59.9	16.0	
Red Chief	94.0		10.3		9.9		0.836	1,563		57.8		58.7	16.2	
LC8602303T	95.0		8.3		9.3		0.823	1,588		37.0		62.4	16.5	
LC99602972T	93.5	a	8.5		9.0		0.829	1,169		39.6		**64.9**	16.0	a
Crimson	95.0		8.5		8.6		0.873	1,029		38.0		63.5	15.5	
LC99602477E	95.5		9.3		9.9		0.807	1,898	a	47.5		62.3	16.3	
CDC Milestone	96.5		9.8		9.7		0.887	1,790	a	39.3		62.6	15.4	
LC8601847E	93.5	a	9.0		9.8		0.878	1,723	a	46.0		62.5	15.3	
Eston	95.0		10.0		9.6		0.887	1,661		35.9		62.9	15.9	
LC99602427P	93.5	a	9.5		10.6		0.830	1,742	a	51.5		62.3	16.3	
LC8601787P	**93.0**	a	9.0		10.4		0.750	1,561		43.7		62.5	16.4	
Pardina	95.0		8.0		8.6		0.824	1,555		42.7		63.6	16.3	
Means	95.1		10.1		10.3		0.832	1,680		56.3		60.5	16.3	
LSD (0.05 by t)	0.7		1.5		0.9		ns	204		2.0		0.6	0.8	
C.V.% (s/means)	1.4		7.1		6.1		12.9	8.6		2.5		0.7	3.3	

[a] - Denotes values equal to highest value (in **bold**) based on $LSD_{(0.05)}$.

Table 64. Western Regional Lentil Trial – Huntley Summary, MT 2002.
Data from Karnes Neil and David Wichman, Montana State University.

Variety	Height	Length	Index	Yield	Test	Moisture	TKW?
PS810765	32.5	41.8	0.779	1206	61.45	8.5	227.2
PS610152	33.2	38.5	0.864	997	63.47	8.7	187.2
CDC Mozart	35.2	39.7	0.889	995	64.02	9.0	184.3
PS610324	37.9	43.4	0.876	994	61.22	8.4	206.3
Swing	39.8	50.0	0.796	991	63.35	8.2	192.3
Cruiser	44.2	48.0	0.922	983	62.77	8.2	190.4
Toledo	39.4	47.3	0.830	964	60.70	8.2	226.3
Eclipse	36.9	38.8	0.948	936	61.20	8.7	207.0
Espace	38.5	42.6	0.906	896	59.07	8.5	181.2
CDC Handel	36.7	39.6	0.924	827	62.25	8.5	166.4
Lifter	28.5	48.1	0.601	809	58.40	8.4	186.8
Majoret	43.6	46.4	0.940	805	63.02	8.9	209.9
Trapper	32.0	66.1	0.485	580	62.75	8.5	111.4
Granger	28.2	66.9	0.432	489	58.65	8.3	110.8
Means	36.2	46.9	0.799	891	61.60	8.5	184.8
LSD	8.0	5.8	0.156	176	3.25	0.3	14.5
CV	15.51	8.636	13.67	13.79	3.685	2.672	5.467
F-value	3.09	20.26	9.7	8.85	2.63	4.77	49.5

Table 65. Western Regional Dry Pea Yield Trial, Kalispell , MT 2002.
Data from Louise Strang and Duane Johnson, Montana State University

Cultivar	Nodes	1st Bloom	Maturity	Yield
	to 1st flw	*days*	*days after seeding*	*lbs/a*
Lifter[1/]	14	65	**88**	253.0
PS610152[1/]	11	68	**86**	246.1
Eiffel[2/]	13	67	**87**	229.2
Midas[2/]	14	67	**88**	**372.3**
Universal[2/]	14	68	85	212.1
mean		67	87	262.5
LSD(0.05)		NS	2.3	96.3
CV(s/mean)		2.5	1.4	20.2

[1/] WR

[2/] Spokane Seed
Planting date: 4/29/02
Seeding rate: 8.3 seeds/sqft
Plot size 4'x15'
Design: RCB, 4 reps
Crop year precipitation (Sept 01 - Aug 02): 17.41 inches
Growing season precip (Apr 02 - Aug 02): 8.91 inches
Growing degree days (base 32): 3561

Fertilizer: 120 lbs/a N, 50 lbs/a P_2O_5, 60 lbs/a K_2O, 20 lbs/a S
Herbicide: Pursuit - 2 oz/a

Table 66. Western Regional Lentil Yield Trial, Kalispell, MT 2002.
Data from Louise Strang and Duane Johnson, Montana State University

Cultivar	Maturity	Yield	Seed Size
	days after seeding	*lbs/a*	*#/lb*
Pennell	113.3	103.9	8617
LC760139L	115.4	218.0	9708
LC860359L	119.7	145.9	9029
LC860616L	119.3	114.6	6972
Merrit	115.4	214.0	7358
LC760209C	116.4	222.6	9906
Crimson	114.2	308.3	14860
LC8602303T	114.5	294.0	15300
LC99602972T	115.7	539.1	16460
Eston	115.0	299.4	16490
LC8601847E	115.7	400.1	14040
LC99602477E	114.7	290.1	11790
Pardina	114.4	386.2	13290
LC8601787P	114.4	250.3	13050
LC99602427P	115.3	356.4	12280
mean	115.6	276.2	11943
LSD(0.05)	2.5	145.3	3025
CV(s/mean)	1.5	36.3	17.7

Planting date: 4/29/02
Seeding rate: 8.3 seeds/sqft
Plot size 4'x15'
Design: RCB, 4 reps
Crop year precipitation (Sept 01 - Aug 02): 17.41 inches
Growing season precip (Apr 02 - Aug 02): 8.91 inches
Growing degree days (base 32): 3561
Fertilizer: 120 lbs/a N, 50 lbs/a P_2O_5, 60 lbs/a K_2O, 20 lbs/a S
Herbicide: Pursuit - 2 oz/a

Table 67. Nebraska Pea Trials, 2002
Data from Glen Frickel and David Baltensperger, University of Nebraska.

	YLD (Lbs/A)			SEEDS/Lb.		
	BB Dry	BB Irri	Chey Dry	Chey Irri	BB Irri	Chey Irri
LIFTER	162	781	32	1136	2373	2572
PS610324	129	902	44	652	2360	2438
PS810765	174	841	85	814	2139	2381
CARNEVAL	160	844	99	864	2516	2687
MAJORET	137	570	69	858	2291	2431
SALUTE	195	998	115	1161	2547	2705
CRUISER	120	804	124	718	2523	2594
WYODUN	164	1202	61	816	2446	2542
MEAN	155	868	79	877	2399	2544
LSD (.05)	52	230	60	718	92	226

Locations:		
	BB Dry	Box Butte County Dryland
	BB Irri	Box Butte County Irrigated
	Chey Dry	Cheyenne County Dryland
	Chey Irri	Cheyenne County Irrigated

Table 68. Nebraska Lentil Plots, 2002
Data from Glen Fickel and David Baltensperger, University of Nebraska.

	YLD (Lbs/A)			SEEDS/Lb.	
	BB Dry	BB Irri	Chey Irri	BB Irri	Chey Irri
LC8601847E	197	481	598	13121	10819
LC99602477E	169	423	611	12868	12617
EstonRS000001	97	423	429	13782	13958
LC99602427P	152	341	364	11133	11149
LC8601787P	81	500	275	12186	11660
PardinaLC920001	141	343	319	13018	12966
LC99602972T	135	355	287	13289	12914
MerritLC460266B	80	252	326	8516	8292
CrimsonLC800024	96	194	334	13143	13364
LC760139L	128	226	269	9269	8542
LC8602303T	119	176	306	15226	13444
LC760209C	112	144	320	9317	7864
LC860616L	77	199	251	8951	7963
LC860359L	81	219	152	10515	8481
PennellLC460197L	99	156	190	8473	7548
MEAN	118	295	336	11520	10772
LSD (.05)	62	141	151	2005	1123

Locations: BB Dry — Box Butte County Dryland
BB Irri — Box Butte County Irrigated
Chey Dry — Cheyenne County Dryland
Chey Irri — Cheyenne County Irrigated

Cheyenne dryland was abandoned to drought.

Table 69. Nebraska Chickpea Plots, 2002
Data from Glen Fickel and David Baltensperger, University of Nebraska.

	YLD (Lbs/A)			SEEDS/Lb.	
	Chey Irri	BB Irri	Chey Dry	Chey Irri	BB Irri
Dwelley	376	149	24	1263	1673
Sierra	241	198	4	1269	1462
CA9990I604C	503	137	2	1039	1635
CA9890233W	205	57	5	1259	1452
B90	291	107	6	1694	2359
WYD201	663	36	4	2175	2260
WYD202	397	376	5	2133	2215
WYK203	409	153	15	1177	1585
harvest July 23	385	151	8	1501	1830
LSD(0.05)	291	235	8	555	360

Locations:			
	BB Dry	Box Butte County Dryland	N 42.22216 W 102.88765
	BB Irri	Box Butte County Irrigated	N 42.22167 W 102.89954
	Chey Dry	Cheyenne County Dryland	N 41.23520 W 103.01620
	Chey Irri	Cheyenne County Irrigated	N 41.23036 W 103.01696

Box Butte County Dryland and irrigated
Watson farm, 7 north of Alliance
Planted April 23
Harvest September 5
Dryland location was abandoned due to drought, and virtually 0 yield.
The irrigated plot suffered from high temperatures, and was in an unfavorable spot in the field where soil and water were lacking.

Cheyenne County Dryland and Irrigated
U. of Nebraska High Plains Ag Lab 5 miles north of Sidney NE
Planted April 25
Harvest August 14
There was some initial moisture, the dryland plot had good stands.
Record drought, along with above normal temperatures, had serious effect on these plots
High temperature stress caused many pods to be empty.

Table 70. North Dakota Chickpea variety trials, 2002.
Data from Steve Zwinger, North Dakota State University.

	Seed Yield (lb/acre)							
Variety	Erie	Hettinger	Dickinson	Minot	Williston	Carrington	Average*	Average**
Kabuli								
CDC Diva	--	893	--	1508	1325	2757	--	1621
CDC Xena	--	1100	--	2010	1281	2908	--	1825
CDCYuma	1458	533	705	2188	1361	2626	1479	1677
Dwelley	836	693	595	1196	917	2589	1138	1349
Evans	--	800	--	2132	1133	2498	--	1641
Sanford	--	727	--	2154	1208	2974	--	1766
Sierra	1393	640	682	2158	1178	2778	1472	1689
Small Kabuli								
Amit (B-90)	1149	1007	702	1827	1748	2190	1437	1693
CDC Chi Chi	--	667	--	2189	1336	3198	--	1848
CDC Chico	1659	1153	786	2182	1578	3661	1837	2144
Specialty								
CDC Verano	--	773	--	1575	1002	2688	--	1510
Desi								
CDC Anna	1827	853	836	2304	1737	2757	1719	1913
CDC Desiray	--	1013	--	1862	1360	3406	--	1910
CDC Nika	--	960	--	1846	1656	2431	--	1723
Myles	1772	1027	663	1601	1431	2583	1513	1661
Experimental								
CDC 92073-40	--	940	--	2306	1529	2530	--	1826
CA99901604C	--	524	--	1817	916	2489	--	1437
CA9890233W	--	313	--	1477	1259	1906	--	1239
Mean	1442	816	710	1907	1331	2726	--	--
LSD 5%	541	228	NS	NS	267	692	--	--

*All sites.
**Hettinger, Minot, Williston, and Carrington.

Table 71. North Dakota Chickpea variety trials, 2002
Data from Steve Zwinger, North Dakota State University.

	Days to First Flower							
Variety	Erie	Hettinger	Dickinson	Minot	Williston	Carrington	Average*	Average**
Kabuli								
CDC Diva	--	60	--	49	46	38	--	48
CDC Xena	--	64	--	47	46	40	--	49
CDCYuma	39	63	48	48	47	41	48	50
Dwelley	41	67	53	49	50	44	51	53
Evans	--	64	--	49	47	41	--	50
Sanford	--	66	--	49	48	44	--	52
Sierra	41	67	50	50	49	44	50	53
Small Kabuli								
Amit (B-90)	40	63	51	47	47	47	49	51
CDC Chi Chi	--	62	--	47	45	40	--	49
CDC Chico	38	59	45	46	43	38	45	47
Specialty								
CDC Verano	--	60	--	45	44	39	--	47
Desi								
CDC Anna	39	59	49	46	43	40	46	47
CDC Desiray	--	59	--	45	42	37	--	46
CDC Nika	--	59	--	44	42	38	--	46
Myles	38	59	49	44	43	38	45	46
Experimental								
CDC 92073-40	--	59	--	45	42	38	--	46
CA99901604C	--	60	--	48	45	39	--	48
CA9890233W	--	66	--	51	48	44	--	52
Mean	39	62	49	47	45	41	--	--
LSD 5%	1	1	1	2	1	2	--	--

*All sites.
**Hettinger, Minot, Williston, and Carrington.

Table 72. North Dakota Chickpea variety trials, 2002
Data from Steve Zwinger, North Dakota State University.

	Plant Height (inches)							
Variety	Erie	Hettinger	Dickinson	Minot	Williston	Carrington	Average*	Average**
Kabuli								
CDC Diva	--	9	--	12	12	22	--	14
CDC Xena	--	10	--	14	12	24	--	15
CDCYuma	19	11	14	15	11	24	16	15
Dwelley	19	11	12	14	13	22	15	15
Evans	--	11	--	17	12	23	--	16
Sanford	--	12	--	16	12	27	--	17
Sierra	20	11	12	18	12	25	16	17
Small Kabuli								
Amit (B-90)	22	11	13	15	13	26	17	16
CDC Chi Chi	--	10	--	15	12	25	--	16
CDC Chico	20	9	13	15	10	21	15	14
Specialty								
CDC Verano	--	7	--	10	8	20	--	11
Desi								
CDC Anna	17	9	13	11	10	24	14	14
CDC Desiray	--	9	--	10	10	22	--	--
CDC Nika	--	9	--	15	12	27	--	--
Myles	16	10	13	11	10	22	14	13
Experimental								
CDC 92073-40	--	11	--	14	13	25	--	16
CA99901604C	--	9	--	12	10	22	--	13
CA9890233W	--	9	--	13	11	24	--	14
Mean	19	10	13	14	11	24	--	--
LSD 5%	NS	1	NS	3	2	NS	--	--

*All sites.
**Hettinger, Minot, Williston, and Carrington.

Table 73. North Dakota Chickpea variety trials, 2002
Data from Steve Zwinger, North Dakota State University.

	Test Weight (lb/bu)							
Variety	Erie	Hettinger	Dickinson	Minot	Williston	Carrington	Average*	Average**
Kabuli								
CDC Diva	--	61.1	--	60.4	62.6	61.0	--	61.3
CDC Xena	--	61.2	--	61.0	63.1	61.5	--	61.7
CDCYuma	60.3	59.4	61.6	60.8	61.6	61.5	60.9	60.8
Dwelley	59.3	56.6	59.9	59.3	59.9	60.1	59.2	59.0
Evans	--	59.7	--	60.8	60.6	61.9	--	60.8
Sanford	--	60.4	--	60.9	62.0	61.0	--	61.1
Sierra	57.7	59.2	58.3	57.4	58.3	58.7	58.3	58.4
Small Kabuli								
Amit (B-90)	59.3	61.8	61.9	61.2	63.3	60.8	61.4	61.8
CDC Chi Chi	--	57.7	--	59.6	59.8	59.7	--	59.2
CDC Chico	60.5	60.0	61.6	61.7	60.3	62.1	61.0	61.0
Specialty								
CDC Verano	--	60.3	--	61.7	61.1	62.5	--	61.4
Desi								
CDC Anna	59.1	57.7	60.8	60.8	61.8	60.6	60.1	60.2
CDC Desiray	--	56.4	--	59.9	59.6	60.0	--	59.0
CDC Nika	--	59.0	--	59.6	61.9	59.9	--	60.1
Myles	56.2	55.8	57.4	58.3	56.6	58.9	57.2	57.4
Experimental								
CDC 92073-40	--	58.3	--	59.8	60.3	56.2	--	58.7
CA99901604C	--	54.6	--	56.6	56.1	58.9	--	56.6
CA9890233W	--	54.5	--	56.2	56.4	60.0	--	56.8
Mean	58.9	58.9	60.2	59.7	60.3	60.3	--	--
LSD 5%	1.3	1.1	1.0	1.5	2.4	1.5	--	--

*All sites.
**Hettinger, Minot, Williston, and Carrington.

Table 74. North Dakota Chickpea variety trials, 2002
Data from Steve Zwinger, North Dakota State University.

	Seeds/Pound							
Variety	Erie	Hettinger	Dickinson	Minot	Williston	Carrington	Average*	Average**
Kabuli								
CDC Diva	--	1230	--	1027	987	911	--	1039
CDC Xena	--	1197	--	935	1009	1167	--	1077
CDCYuma	1294	1285	1109	1076	1102	1053	1153	1129
Dwelley	1293	1078	842	1027	904	903	1008	978
Evans	--	1366	--	1025	1081	1048	--	1130
Sanford	--	1285	--	983	1009	1070	--	1087
Sierra	1122	1163	845	999	938	887	992	997
Small Kabuli								
Amit(B-90)	2144	1694	1706	1892	1669	1829	1822	1771
CDC Chi Chi	--	1379	--	1144	1297	1254	--	1269
CDC Chico	2054	1940	1642	1808	1957	1568	1828	1818
Specialty								
CDC Verano	--	2609	--	2387	2580	2345	--	2480
Desi								
CDC Anna	2370	2536	2246	2318	2142	2249	2310	2311
CDC Desiray	--	2785	--	2294	2316	2289	--	2421
CDC Nika	--	2018	--	1419	1419	1436	--	1573
Myles	2831	2752	2603	2275	2495	2501	2576	2506
Experimental								
CDC 92073-40	--	1823	--	1406	1465	1513	--	1552
CA99901604C	--	1343	--	985	1041	926	--	1074
CA9890233W	--	1523	--	748	958	1026	--	1064
Mean	1873	1555	1570	1333	1290	1450	--	--
LSD 5%	280	--	239	--	--	219	--	--

*All sites.
**Hettinger, Minot, Williston, and Carrington.

Table 75. NDSU Carrington Research Extension Center, Regional Field Pea Nursery, 2002
Data from Blaine Schatz, North Dakota State University

Obs	Variety	Days to Bloom	Bloom Duration	Vine Length	Seeds/ Pound	1000 KWT	Test Weight	Seed Yield
				cm		gms	lbs/bu	bu/ac
1	DELTA	45.7	17.0	84	2034	223	63.4	54.3
2	INTEGRA	42.7	18.0	77	1839	247	62.6	51.6
3	LIFTER	47.0	24.3	71	2245	203	62.8	28.7
4	PS0010038	46.0	15.0	63	2270	200	62.8	46.0
5	PS0010067	35.7	24.0	66	2168	209	63.3	35.1
6	PS0010128	45.7	21.0	61	2102	217	63.2	50.7
7	PS0010803	44.7	20.0	59	1981	230	63.3	43.2
8	PS0010804	45.7	21.3	64	2169	209	63.1	42.4
9	PS0010836	43.3	19.0	64	1623	280	63.1	54.7
10	PS0010946	41.7	25.7	80	1795	253	63.9	47.0
11	PS0010971	45.0	19.7	66	1965	231	63.8	45.5
12	PS0010972	44.7	21.0	64	1988	228	63.6	46.4
13	PS0010973	44.3	24.0	65	1900	239	63.6	47.9
14	PS0010993	46.0	17.3	66	2033	224	63.3	56.0
15	PS610152	41.0	25.7	63	2165	210	64.1	51.6
16	PS610324	45.3	17.0	64	1891	240	63.7	49.5
17	PS7101149	39.0	28.3	74	1846	247	63.7	37.1
18	PS810765	41.3	24.7	67	1556	292	64.2	47.4
19	PS99102238	48.0	17.7	78	2039	224	63.4	51.9
20	TOLEDO	41.7	19.7	77	1751	259	63.1	59.1
	MEAN	43.7	21.0	69	1968	233	63.4	47.3
	C.V.%	1.5	8.4	8.4	4.7	4.3	0.6	9.6
	LSD.05	1.1	2.9	9.5	154	17	0.7	7.5
	LSD.01	1.4	3.9	12.8	207	22	0.9	9.9
	#REPS	3	3	3	3	3	3	3

Planting Date = May 20; Harvest Date = August 20; Previous Crop = Durum

Table 76. Washington Field Pea Trial – Minot, ND 2002
Data from Mark Halvorson, North Dakota State University

Plot	Rep	Treatment	Variety	Plot	First Flower	Last Flower	Days to PM	Harvest Index	Lodge	Test Weight	Yield 7-ROWS	Yield 6-ROWS	rep
1	1	1	Lifter	1	56	67	83	9	9	61.8	1511	1763	1
2	1	2	Toledo	2	52	64	80	2	2	62.7	2406	2406	1
3	1	3	Delta	3	53	65	81	2	1	63.8	2964	3458	1
4	1	4	Integra	4	53	64	80	1	2	63.5	2639	3078	1
5	1	5	PS610152	5	51	63	83	1	2	63.8	3015	3518	1
6	1	6	PS610324	6	53	64	83	2	2	62.6	2197	2197	1
7	1	7	PS7101149	7	51	65	81	8	7	63.6	2443	2850	1
8	1	8	PS810765	8	51	63	81	9	8	65.2	2149	2507	1
9	1	9	PS0010128	9	55	66	83	2	2	63.8	2920	3406	1
10	1	10	PS0010804	10	53	65	79	6	7	64.5	2183	2547	1
11	1	11	PS99102238	11	56	64	80	1	1	63.4	2217	2587	1
12	1	12	PS0010836	12	54	64	80	3	3	64.2	2546	2970	1
13	1	13	PS0010946	13	53	65	81	2	2	63.7	2022	2359	1
14	1	14	PS0010993	14	54	65	80	2	3	64.4	2779	3242	1
15	1	15	PS0010038	15	56	64	80	3	2	63.9	2292	2675	1
16	1	16	PS0010067	16	50	64	80	8	7	62.8	1388	1619	1
17	1	17	PS0010803	17	53	65	80	7	7	64.1	2591	3022	1
18	1	18	PS0010971	18	53	66	81	5	6	65.1	2279	2659	1
19	1	19	PS0010972	19	54	66	81	4	5	64.1	2471	2471	1
20	1	20	PS0010973	20	54	66	79	5	5	64.1	2152	2511	1
27	2	1	Lifter	27	56	67	81	9	9	62.6	1916	2235	2
25	2	2	Toledo	25	51	64	79	1	2	62.5	2073	2419	2
35	2	3	Delta	35	54	66	79	1	1	65.6	1809	2111	2
31	2	4	Integra	31	51	66	78	1	1	64.2	1933	2255	2
36	2	5	PS610152	36	51	66	83	2	2	63.6	1987	2319	2
23	2	6	PS610324	23	55	65	83	1	2	63.4	2724	3178	2
40	2	7	PS7101149	40	51	65	81	7	5	64.3	1847	2155	2
33	2	8	PS810765	33	51	65	79	8	8	65.0	1251	1459	2
29	2	9	PS0010128	29	55	66	81	1	1	63.6	2419	2822	2
32	2	10	PS0010804	32	53	65	78	2	2	64.3	2193	2559	2
24	2	11	PS99102238	24	56	66	83	1	1	63.6	3317	3870	2
37	2	12	PS0010836	37	54	65	82	3	2	64.2	2258	2635	2
34	2	13	PS0010946	34	53	66	78	3	2	63.7	1823	2127	2

Table 76. Washington Field Pea Trial – Minot, ND 2002 Continued

Plot	Rep	Treatment	Variety	Plot	First Flower	Last Flower	Days to PM	Harvest Index	Lodge	Test Weight	Yield 7-ROWS	Yield 6-ROWS	rep
21	2	14	PS0010993	21	55	66	80	1	3	64.5	2824	3294	2
38	2	15	PS0010038	38	56	66	79	2	1	64.1	2286	2667	2
22	2	16	PS0010067	22	52	64	79	8	8	62.9	1796	1796	2
26	2	17	PS0010803	26	53	65	79	6	7	64.4	2515	2934	2
30	2	18	PS0010971	30	54	64	79	6	3	65.0	2358	2750	2
39	2	19	PS0010972	39	53	66	79	4	4	64.2	2385	2385	2
28	2	20	PS0010973	28	52	66	79	8	8	64.4	2282	2663	2
51	3	1	Lifter	51	56	67	84	7	7	62.1	1566	1827	3
55	3	2	Toledo	55	53	65	79	3	2	63.0	1497	1747	3
46	3	3	Delta	46	54	64	81	1	1	64.4	2782	3246	3
58	3	4	Integra	58	53	63	80	1	1	64.0	1874	2187	3
56	3	5	PS610152	56	51	64	81	1	1	64.0	1761	2055	3
43	3	6	PS610324	43	55	65	83	1	1	63.5	2515	2934	3
52	3	7	PS7101149	52	51	63	80	5	5	63.8	1635	1907	3
54	3	8	PS810765	54	51	64	78	3	3	65.3	1614	1883	3
48	3	9	PS0010128	48	56	66	81	3	2	64.3	2700	3150	3
42	3	10	PS0010804	42	54	64	80	8	7	64.0	2769	3230	3
53	3	11	PS99102238	53	56	66	79	2	1	63.4	1898	2215	3
59	3	12	PS0010836	59	55	64	84	2	2	64.3	2179	2543	3
49	3	13	PS0010946	49	54	66	81	2	2	63.7	2563	2990	3
47	3	14	PS0010993	47	55	65	79	1	1	64.5	2721	3174	3
41	3	15	PS0010038	41	56	65	82	2	2	64.4	2981	2981	3
57	3	16	PS0010067	57	50	62	79	9	7	63.5	860	1003	3
44	3	17	PS0010803	44	54	64	79	7	7	64.3	2700	3150	3
50	3	18	PS0010971	50	54	66	81	5	7	65.1	2591	3022	3
60	3	19	PS0010972	60	54	65	81	4	3	64.0	1960	1960	3
45	3	20	PS0010973	45	52	63	80	5	6	64.4	2714	3166	3

Planting Date: May 5, 2002
Harvest Date: July 31, 2002

Table 77. Field Data from Minot, ND - Pea Yield Trial, 2002
Data from Mark Halvorson, North Dakota State University.

Name	Entry	First Flower	Last Flower	Days to PM	Harvest Index	Lodge	Test Weight	Yield	
								7-ROWS	6-ROWS
Lifter	1	56.0	67.0	82.7	8.3	8.3	62.2	1664.2	1941.6
Toledo	2	52.0	64.3	79.3	2.0	2.0	62.7	1992.0	2190.4
Delta	3	53.7	65.0	80.3	1.3	1.0	64.6	2518.6	2938.4
Integra	4	52.3	64.3	79.3	1.0	1.3	63.9	2148.5	2506.6
PS610152	5	51.0	64.3	82.3	1.3	1.7	63.8	2254.8	2630.6
PS610324	6	54.3	64.7	83.0	1.3	1.7	63.2	2478.6	2769.7
PS7101149	7	51.0	64.3	80.7	6.7	5.7	63.9	1974.9	2304.1
PS810765	8	51.0	64.0	79.3	6.7	6.3	65.1	1671.1	1949.6
PS0010128	9	55.3	66.0	81.7	2.0	1.7	63.9	2679.7	3126.3
PS0010804	10	53.3	64.7	79.0	5.3	5.3	64.3	2381.5	2778.5
PS99102238	11	56.0	65.3	80.7	1.3	1.0	63.4	2477.5	2890.4
PS0010836	12	54.3	64.3	82.0	2.7	2.3	64.2	2327.9	2715.8
PS0010946	13	53.3	65.7	80.0	2.3	2.0	63.7	2136.0	2492.0
PS0010993	14	54.7	65.3	79.7	1.3	2.3	64.5	2774.5	3236.9
PS0010038	15	56.0	65.0	80.3	2.3	1.7	64.1	2519.8	2774.1
PS0010067	16	50.7	63.3	79.3	8.3	7.3	63.0	1347.8	1472.7
PS0010803	17	53.3	64.7	79.3	6.7	7.0	64.3	2602.0	3035.7
PS0010971	18	53.7	65.3	80.3	5.3	5.3	65.0	2409.0	2810.5
PS0010972	19	53.7	65.7	80.3	4.0	4.0	64.1	2271.9	2271.9
PS0010973	20	52.7	65.0	79.3	6.0	6.3	64.3	2382.7	2779.8
	Minimum	51	63	79	1	1	62	1348	1473
	Maximum	56	67	83	8	8	65	2774	3237
	Average	53	65	80	4	4	64	2251	2581

Table 78. Winter Pea and Lentil Yields, Moro, OR 2002
Data from Stephen Machado, Oregon State University

Winter Legume Grain Yields

The following are grain yields from winter peas and winter lentils grown in the 2001-2002 crop year at the Sherman Experiment Station, Moro, Oregon. Moro is located 45°N and 121°West at an elevation of 1835 ft. The soils are Walla Walla silt loams that are 4 to 6 feet deep. Moro receives about 11.4 inches per crop year (70 year average). The station received 8.5 inches in the 2001-2002 crop year when the legumes were planted. Below is the summary of the legumes grain yields. Both crops were grown after fallow.

Winter Peas		Winter lentils	
Entry	Grain yield (lb/a)	Entry	Grain yield (lb/a)
PS9430706	1415.6a	WA8649041	722.02b
PS9430726	1388.9a	LC9440070	606.43b
PS9530645	532.6b	WA8649090	899.86a

Table 79. South Dakota State University Chickpea Variety Trial, 2002. Jan-20-03 (Chickpea Variety Trial 2002 - Olerichs) AOV Means Table.
Data from John Rickertsen, South Dakota State University

Character Rated		Height	Yield	Seeds/oz	100 seed wt
Rating Data Type					
Rating Unit		Inches	Lb/A		wt/100
Rating Date		Aug-12-02			
ARM Action Codes			TY3		T4
# Subsamples, Dec.			0		1
Trt No.	Treatment Name				
1	CDC Diva	11.8 bcd	1452 a	64.0	44.4
2	Dwelly	13.0 abc	1397 ab	75.0	37.9
3	Evans	14.5 a	1394 ab	74.0	38.4
4	Sanford	14.3 a	1417 a	76.0	37.4
5	Sierra	13.0 abc	1414 a	67.0	42.4
6	CDC Yuma	13.3 ab	1388 ab	74.0	38.4
7	CDC Xena	12.3 bcd	1435 a	62.0	45.8
8	Amit	12.3 bcd	1394 ab	121.0	23.5
9	CDC Chico	13.0 abc	1343 ab	120.0	23.7
10	CDC Anna	11.3 cd	1280 b	152.0	18.7
11	CDC Desiray	10.5 d	1069 c	149.0	19.1
12	Myles	11.3 cd	1141 c	172.0	16.5
13	CDC Nika	10.8 d	1385 ab	152.0	18.7
LSD (P=.05)		1.21	82.7	.	.
Standard Deviation		0.85	57.3	.	.
CV		6.84	4.25	.	.
Grand Mean		12.38	1346.85	104.46	31.13
Bartlett's X2		7.695	23.711	.	.
P(Bartlett's X2)		0.808	0.022*	.	.
Replicate F		7.500	0.294		
Replicate Prob(F)		0.0005	0.8292		
Treatment F		8.857	16.516		
Treatment Prob(F)		0.0001	0.0001		

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

Table 80. South Dakota State University Field Pea CPT, 2002. Jan-03-03 (Field Pea CTP 2002 – Selby) Standardized Summary.

Character Rated		Height	Test Wt	Yield
Rating Unit		Inches	Lb/Bu	Bu/A
Rating Date		Jul-09-02		
ARM Action Codes				TY1
# Subsamples, Dec.				1
Trt No.	Treatment Name			
1	Arvika	26.3	61.60	19.7
2	Lifter	19.7	62.73	21.8
3	Grande	20.7	63.70	27.1
4	Athos	16.0	62.90	17.2
5	Carneval	17.0	62.93	15.2
6	Eclipse	16.3	63.03	18.3
7	Highlight	18.0	62.43	18.0
8	Integra	19.7	61.73	17.5
9	CEB 1489	15.7	64.27	24.3
10	LPK 3035	16.0	61.10	17.5
11	Bluebird	15.7	63.20	16.4
12	Cruiser	17.3	63.07	16.5
13	Journey	24.7	62.33	18.1
14	Madoo	17.0	62.17	19.3
15	Majoret	19.0	62.50	17.8
16	Millenium	15.3	62.43	16.3
17	Toledo	19.7	62.43	19.3
18	CEB 1171	15.7	62.67	20.8
19	PS610152	15.3	63.50	16.1
20	VM96901	18.0	63.93	16.0
LSD (P=.05)		2.81	1.322	6.93
Standard Deviation		1.70	0.801	4.20
CV		9.37	1.28	22.53
Grand Mean		18.15	62.73	18.66
Bartlett's X2		14.183	14.151	38.879
P(Bartlett's X2)		0.773	0.775	0.005*
Replicate F		2.194	3.588	1.248
Replicate Prob(F)		0.1254	0.0374	0.2986
Treatment F		9.475	2.844	1.480
Treatment Prob(F)		0.0001	0.0030	0.1492

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)
Data from John Rickertsen, South Dakota State University.

Table 81. Dry Pea Yield Trial, Torrington, WY 2002
Data from Jim Krall, University of Wyoming.

Grain Pea ENTRY	2002 TORRINGTON IRRIGATED
Cruiser	980.3
Salute	922.3
Carneval	910.3
PS810765	860.3
Majoret	771.0
PS610324	756.5
WyoDun	620.5
Lifter	494.3
AVERAGE	791.5
LSD 0.05	277.2
CV	11.9

Table 82. Chickpea Yield Trial, Torrington, WY 2002
Data from Jim Krall, University of Wyoming

Chickpea ENTRY	TYPE	2002 TORRINGTON IRRIGATED
B 90		2752
WY K203	Kabuli	2478
WY D202	Desi	2478
Sierra	Kabuli	2192
WY D201	Desi	2180
Dwelley	Kabuli	2162
CA 9890233W	Kabuli	1658
CA 99901604C	Kabuli	1639
AVERAGE		2206
LSD 0.05		443.6
CV		6.86

Table 83. Lentil Yield Trial, Torrington, WY 2002
Data from Jim Krall, University of Wyoming

Lentil ENTRY	2002 TORRINGTON IRRIGATED
Eston RS000001	631.6
LC8601847E	424.3
LC99602477E	410.8
Pardina LC920001	396.3
LC99602427P	378.8
LC8601787P	354.3
LC8602303T	315.3
LC760139L	306.3
LC99602972T	306.3
Crimson LC800024	255.8
LC860616L	251.3
LC760209C	239.5
Pennell LC460197L	194.8
LC860359L	190.3
Merril LC460266B	189.6
AVERAGE	321.8
LSD 0.05	186.4
CV	20.18