Dry Pea, Lentil, Chickpea and Winter Legume Breeding

2006 Progress Report

Prepared by

Grain Legume Genetics and Physiology Research Unit

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and

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Acknowledgements

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Spring Pea Yield Testing

Advanced and preliminary breeding lines of green, yellow and marrowfat peas were tested in yield trials during the 2006 crop season. Trials were conducted at Pullman, Fairfield and Walla Walla, WA, and at Genesee, ID in 2006 where average yields were produced compared to previous years. In addition to advanced and preliminary trials in the Palouse, an observation trial of 44 early generation breeding lines were evaluated at four North Dakota environments, Minot, Carrington, Williston and Hettinger. This trial has been conducted for several years and has generated valuable performance data for the Midwest environments. We also expanded testing and selection efforts in North Dakota to include early generation populations. Fifty segregating populations were grown at Carrington, ND in 2005 and 2006 and several individual plant selections were made based on disease resistance and agronomic parameters. These selections will be tested in larger plots as seed is available and tested in the Palouse as part of a reciprocal exchange program.

Physical appearance and cooking quality are priorities in the breeding program. Overall quality was good in 2006 with seed bleach at a low level. All green pea breeding lines were subjected to an simulated bleach test and those with high bleach scores were discarded. Cooking quality assays were conducted on the entries in the regional yield trials. All entries performed well with attributes suited to the edible and canning markets.

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 (canopy height/vine length) for the breeding lines in the 2006 trials ranged from 0.14 to 1.00. The low values were for those cultivars with conventional plant type. Continued selection for improved stem properties will improve overall plant stature.

Disease Screening

All pea breeding lines are evaluated for resistance to disease in a network of nurseries across the Palouse and in the Midwest. Expansion of the disease screening effort will provide greater efficiencies in developing improved pea breeding lines with multiple disease resistance applicable to all US production regions. Resistance to pea enation mosaic virus is evaluated at Corvallis, OR, resistance to fusarium wilt race 1 and tolerance to aphanomyces root rot are evaluated in nurseries at the Spillman Research Farm and tolerance to fusarium root rot is evaluated at Prosser, WA. Reaction to fusarium wilt race 2 is being performed under controlled conditions in growth chambers at Pullman and has identified a number elite breeding lines with resistance. Individual selections with resistance identified in these trials are being used to transfer their respective resistances to new varieties.

Variety Releases

Stirling, an upright green cotyledon pea was released in 2003. Medora, tested as PS99102238, is a green cotyledon pea showing outstanding agronomic performance in the Midwest production region and was proposed for release in 2006. An increase of breeder seed was conducted in Brawley, CA during the winter of 2005 and foundation seed was produced during the 2006 field season in ND. An additional increase is currently being grown near Yuma, AZ during the winter of 2006. PS01102958, a yellow cotyledon spring pea has broad adaptation, excellent agronomic performance and outstanding seed quality. The initial lot of pre-breeder seed was increased at Spillman Research Farm during the 2006 field season and approximately 500 lbs of breeder seed was produced. Full release of this line will be requested at the 2007 WSU Legume Variety Release Committee Meeting and given a favorable vote, foundation seed will be produced during the 2007 crop season.

Table 1. Location Yield Summary (kg/ha) for the Advanced Green Dry Pea Yield Trial, 2006 (0601)

Cultivar	Origin	Leaf Type	Plant Type	Genesee	Pullman	Walla Walla	Mean Seed Yield
PS03101340	X00P111	-	-	1997	2373	2970	2447
PS02100107	X98P022	-	-	2071	2102	3032	2402
PRO 031-7053	…	-	-	1970	2273	2915	2386
PS03101459	X98P025	-	-	1715	2357	3032	2368
PS03101445	X98P024	-	-	1843	2419	2829	2364
K-2	…	-	-	1876	2224	2948	2349
PS0110745	X98P020	-	-	1887	2274	2825	2329
PS03101349	X00P111	-	-	1882	2195	2891	2322
PACIFICA	…	-	-	1655	2232	3063	2317
PS03101347	X00P111	-	-	1942	2218	2747	2303
PS0110827	X98P026	-	-	1920	2191	2739	2283
PS02100128	X98P024	-	-	1827	2204	2778	2270
PS0110805	X98P025	-	-	1525	2313	2923	2253
ARIEL	…	-	-	1835	2184	2708	2242
MONARCH	…	-	-	2135	2176	2407	2239
PS02100224	X99P235	-	-	2081	2210	2420	2237
PS02100026	X98P006	-	-	1659	2015	3021	2232
ARAGORN	…	-	-	1782	2007	2834	2208
PS0110767	X98P022	-	-	1751	2076	2779	2202
STIRLING	X93P022	-	-	1733	1968	2900	2200
CRUISER	…	-	-	1715	2113	2588	2139
PS03100116	X94P106	-	-	1725	2260	2301	2096
LIFTER	X93P045	+	-	1661	1852	2692	2068
COLUMBIAN(LOT-I)*	…	+	+	1927	1682	2448	2019
PRODIGY	…	-	-	1515	1733	2390	1880
MEDORA	X95P768	-	-	1380	1872	…	1626
Grand Mean				1808	2135	2767	2222
C.V. (%)				10	7	10	9
LSD (α=0.05)				241	210	374	193
Planting Date				4/26/06	4/28/06	4/24/06	
Harvest Date				8/2/06	7/31/06	8/8/06	

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 of the three locations.

*Check variety.

Table 2. Agronomic Data for the Advanced Green Dry Pea Yield Trial, 2006 (0601)

Cultivar	Origin	FW	Aphano-myces	PEMV	Days to Flower	Days to Maturity	Nodes to First Flower	Pods/ Peduncle	Mean Pod Ht (green)	Mean Pod Ht (mature)	Mean Pod Ht Index	Mean Plant Ht (green)	Mean Plant Ht (mature)	Mean Plant Ht Index	Rep Nodes	Weight 100 Seed
									..cm..	..cm..		..cm..	..cm..			..g..
PS03101340	X00P111	+	3.7	-	47	87	16	2	45	16	0.36	82	36	0.43	5	24.5
PS02100107	X98P022	+	3.3	-	54	87	21	2	46	44	0.96	57	55	0.97	3	19.4
PRO 031-7053	…	…	3.8	-	52	88	18	2	55	41	0.75	74	58	0.78	3	20.4
PS03101459	X98P025	+	3.2	-	55	87	20	2	55	39	0.70	72	57	0.79	3	21.8
PS03101445	X98P024	+	4.0	-	57	87	19	1	49	36	0.74	66	55	0.84	4	20.8
K-2	…	-	4.3	-	52	87	19	2	44	44	1.00	60	60	1.00	3	21.9
PS0110745	X98P020	+	3.5	-	52	87	18	2	44	36	0.82	60	51	0.86	4	23.3
PS03101349	X00P111	+	2.8	-	50	87	18	2	49	29	0.61	78	50	0.64	5	23.2
PACIFICA	…	+	3.5	-	57	88	19	2	53	34	0.63	74	47	0.64	4	22.4
PS03101347	X00P111	+	4.0	-	52	87	20	2	59	22	0.37	89	37	0.41	4	22.1
PS0110827	X98P026	+	3.8	-	55	88	21	2	61	43	0.70	77	63	0.82	3	17.9
PS02100128	X98P024	+	3.7	-	58	88	22	2	59	47	0.80	76	68	0.89	4	23.5
PS0110805	X98P025	+	2.5	-	59	89	22	2	59	45	0.77	73	60	0.82	4	23.1
ARIEL	…	+	3.3	-	57	87	21	2	56	49	0.88	70	64	0.92	4	19.3
MONARCH	…	+	3.7	-	49	87	15	2	30	22	0.75	57	42	0.74	4	18.8
PS02100224	X99P235	+	4.7	-	48	88	18	2	52	26	0.49	74	37	0.51	4	22.8
PS02100026	X98P006	+	4.3	-	59	88	22	2	58	15	0.26	70	27	0.39	3	27.9
ARAGORN	…	…	2.8	-	55	87	20	2	50	42	0.83	64	60	0.94	4	19.4
PS0110767	X98P022	+	3.3	-	52	87	19	2	45	35	0.77	63	54	0.85	4	17.4
STIRLING	X93P022	+	4.0	-	52	88	15	3	35	28	0.94	58	42	0.73	4	20.3
CRUISER	…	+	4.2	-	58	59	21	2	58	46	0.81	72	62	0.86	3	18.1
PS03100116	X94P106	+	3.5	-	60	89	21	2	67	27	0.40	82	43	0.53	3	20.8
LIFTER	X93P045	+	2.7	+	61	89	17	2	53	5	0.11	72	16	0.22	4	20.6
COLUMBIAN(LOT-I)*	…	+	3.3	-	43	87	12	1	39	8	0.20	97	38	0.39	6	19.2
PRODIGY	…	…	4.0	-	57	87	22	2	55	39	0.72	68	57	0.84	3	17.2
MEDORA	X95P768	-	4.0	-	59	88	21	2	60	47	0.79	72	66	0.93	3	20.0
Grand Mean			3.6		54	86	19	2	51	33	0.66	71	50	0.72	4	21.0
C.V. (%)			17.0		4	12	7	22	10	14	21.40	5	9	11.29	21	
LSD $_{(\alpha=0.05)}$			0.8		3	14	2	1	7	6	0.19	5	6	0.11	1	

FW = Fusarium wilt race 1; + = resistant, - = susceptible.

Aphanomyces = Aphanomyces root rot; 1 = no symptoms, 2 = 20% of lower leaves symptomatic, 3 = 50% of leaves symptomatic and plant stunted, 4 = 80% of leaves symptomatic and plant stunted, 5 = all plants dead.

PEMV = Pea enation mosaic virus, + = resistant, - = susceptible.

Pod height was measured at the green pod stage and at harvest maturity. Pod height index was determined by dividing pod height at harvest maturity by the green pod height.

Plant height was measured at the green plant stage and at harvest maturity. Plant height index was determined by dividing plant height at harvest maturity by the green plant height.

Rep Nodes = average number of reproducing nodes on a plant.

Agronomic data are means of three replications at Pullman, WA

*Check variety.

Table 3. Mean Yields of the Advanced Green Dry Pea Yield Trial, 2002 - 2006

Cultivar	Origin	Leaf Type	Plant Type	2002		2003		2004		2005		2006	
				kg/ha	% check	kg/ha	% check	kg/ha	% check	kg/ha	% check	kg/ha	% check
PS03101340	X00P111	-	-	…	…	…	…	…	…	…	…	2447	121
PS02100107	X98P022	-	-	…	…	…	…	…	…	1928	96	2402	119
PRO 031-7053	…	-	-	…	…	…	…	…	…	…	…	2386	118
PS03101459	X98P025	-	-	…	…	…	…	…	…	…	…	2368	117
PS03101445	X98P024	-	-	…	…	…	…	…	…	…	…	2364	117
K-2	…	-	-	…	…	…	…	…	…	…	…	2349	116
PS0110745	X98P020	-	-	…	…	…	…	3774	116	2409	120	2329	115
PS03101349	X00P111	-	-	…	…	…	…	…	…	…	…	2322	115
PACIFICA	…	-	-	…	…	…	…	…	…	…	…	2317	115
PS03101347	X00P111	-	-	…	…	…	…	…	…	…	…	2303	114
PS0110827	X98P026	-	-	…	…	…	…	3613	111	1995	100	2283	113
PS02100128	X98P024	-	-	…	…	…	…	…		2122	106	2270	112
PS0110805	X98P025	-	-	…	…	…	…	3567	110	2296	115	2253	112
ARIEL	…	-	-	…	…	…	…	…	…	…	…	2242	111
MONARCH	…	-	-	…	…	…	…	…	…	…	…	2239	111
PS02100224	X99P235	-	-	…	…	…	…	…	…	…	…	2237	111
PS02100026	X98P006	-	-	…	…	…	…	…	…	2248	112	2232	111
ARAGORN	…	-	-	…	…	…	…	…	…	…	…	2208	109
PS0110767	X98P022	-	-	…	…	…	…	3831	118	2529	126	2202	109
STIRLING	X93P022	-	-	2025	117	1657	115	3642	112	2608	130	2200	109
CRUISER	…	-	-	…	…	…	…	…	…	…	…	2139	106
PS03100116	X94P106	-	-	…	…	…	…	…	…	…	…	2096	104
LIFTER	X93P045	+	-	1938	112	1616	113	3306	102	2553	127	2068	102
COLUMBIAN(LOT-I)*	…	+	+	1728	100	1436	100	3248	100	2003	100	2019	100
PRODIGY	…	-	-	…	…	…	…	…	…	…	…	1880	93
MEDORA	X95P768	-	-	…	…	…	…	…	…	…	…	1626	81
Grand Mean				1850		1587		3598		2238		2222	
LSD $_{(\alpha=0.05)}$				159		128		379		215		193	

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 in each year except 2005 and 2006.
*Check variety

Table 4. Agronomic and Yield Data for the Preliminary Green Dry Pea Yield Trial, 2006 (0603)

Cultivar	Origin	Leaf Type	Plant Type	FW	PM	Aphano-myces	PEMV	Days to Flower	Days to Maturity	Nodes to First Flower	Pods/ Peduncle	Pod Ht (green)	Pod Ht (mature)	Pod Ht Index	Plant Ht (green)	Plant Ht (mature)	Plant Ht Index	Rep Nodes	Weight 100 Seed	Seed Yield
												..cm..	..cm..		..cm..	..cm..			..g..	..kg/ha..
PS04100610	X00P178	-	-	+	-	3.2	-	53	87	19	2	56	45	0.81	75	66	0.88	4	23.5	2640
PS04100372	X00P073	-	-	+	...	3.8	-	51	87	16	2	52	54	1.07	73	68	0.95	4	24.1	2579
PS04100345	X00P033	-	-	+	...	4.5	-	47	87	14	2	28	23	0.83	61	38	0.62	7	19.8	2556
PS04100337	X00P031	-	-	+	...	3.7	-	59	88	21	2	71	25	0.36	87	42	0.49	4	19.0	2549
PS04100993	X00P112	-	-	+	...	2.8	-	52	89	19	2	61	48	0.78	80	65	0.82	4	23.5	2503
PS04100346	X00P033	-	-	+	...	3.7	-	52	88	19	2	64	17	0.27	80	34	0.43	4	23.0	2495
PS04100420	X00P106	-	-	+	...	3.8	-	54	88	18	2	60	54	0.90	77	68	0.88	4	21.9	2418
PS04100632	X00P182	-	-	+	...	4.0	-	52	87	21	2	66	58	0.89	81	71	0.88	3	23.0	2405
PS04100232	X98P020	-	-	+	...	4.0	-	59	88	21	2	54	50	0.92	70	64	0.92	4	20.3	2390
LIFTER	X93P045	+	-	+	-	3.2	+	59	0	18	2	61	3	0.05	82	16	0.20	5	20.7	2344
PS04100462	X00P130	-	-	+	-	4.2	+	61	89	20	2	49	37	0.75	63	49	0.78	3	21.8	2314
PS04100598	X00P175	-	-	+	-	3.8	-	61	89	21	2	62	48	0.77	74	63	0.85	3	20.6	2288
PS04100328	X00P027	-	-	+	...	4.0	-	61	59	22	2	63	45	0.71	75	61	0.81	3	28.3	2252
PS04100505	X00P146	-	-	+	-	4.0	-	52	89	19	2	41	35	0.84	58	51	0.88	5	23.9	2236
MEDORA	X95P768	-	-	-	-	4.0	-	61	89	21	2	66	63	0.95	79	78	0.99	3	21.6	2232
PS04100265	X98P196	-	-	+	...	3.5	-	52	87	17	2	42	11	0.26	59	27	0.46	3	17.7	2221
PS04100476	X00P133	-	-	+	...	3.3	-	59	87	20	2	57	24	0.43	68	36	0.54	3	21.3	2159
PS04100551	X00P158	-	-	+	...	3.7	-	58	89	18	2	57	18	0.33	69	28	0.42	3	22.1	2084
PS04100557	X00P160	-	-	+	-	3.7	-	60	89	20	2	57	62	1.10	74	78	1.05	4	24.5	1973
PS04100407	X00P104	-	-	+	...	3.8	-	52	59	16	2	35	35	1.01	52	52	1.00	5	23.1	1956
PS04100409	X00P104	-	-	+	...	4.2	-	52	87	17	2	58	53	0.93	71	71	0.99	4	24.0	1939
Grand Mean						3.7		56	81	19	2	55	38	0.71	72	54	0.75	4	22.2	2311
C.V. (%)						11.6		1	19	9	9	9	16	20.10	7	10	12.38	18	9.9	6
LSD $_{(\alpha=0.05)}$						0.6		1	21	2	0	7	8	0.20	7	7	0.13	1	0.0	186

Planting date 4/28/06. Harvest date 7/31/06. Agronomic and yield data are means of three replications at Pullman, WA.

Leaf type; + = normal leaf, - = *afila* or semileafless type. Rep Nodes = average number of reproducing nodes on a plant.

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

FW = Fusarium wilt race 1; + = resistant, - = susceptible.

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

Aphanomyces = Aphanomyces root rot; 1 = no symptoms, 2 = 20% of lower leaves symptomatic, 3 = 50% of leaves symptomatic and plant stunted, 4 = 80% of leaves symptomatic and plant stunted, 5 = all plants dead.

PEMV = Pea enation mosaic virus, + = resistant, - = susceptible.

Pod height was measured at the green pod stage and at harvest maturity. Pod height index was determined by dividing pod height at harvest maturity by the green pod height.

Plant height was measured at the green plant stage and at harvest maturity. Plant height index was determined by dividing plant height at harvest maturity by the green plant height.

Marrowfat Pea Trial Results

Advanced marrowfat pea yield trials comprised ten breeding lines and two named cultivars, ‘Guido’ and ‘Supra’, as checks (Table 5). Six breeding lines produced greater seed yield than Guido and Supra. Average yield for the checks was 1586 kg/ha while yield for the top six breeding lines ranged 28.8.7 to 33.7 (PS02100735). Plant height indices ranged from 0.43 to 0.91 a marked improvement compared to previous years. The six highest yielding lines all possess afila leaf morphology and short vine length. Significant progress has been made in converting the marrowfat germplasm in the breeding program to a plant type with potential for improved plant stature.

The preliminary marrowfat yield trial comprised five breeding lines and two check cultivars, Guido, Supra and (Table 8). Two breeding lines, PS04100977 and PS04100857 outyielded the checks by 107 and 30 kg/ha, respectively.

Disease Screening

All pea breeding lines are evaluated for resistance to disease in a network of nurseries across the PNW. Expansion of the disease screening effort will provide greater efficiencies in developing improved pea breeding lines with multiple disease resistance applicable to all US production regions. Resistance to pea enation mosaic virus is evaluated at Corvallis, OR, resistance to fusarium wilt race 1 and tolerance to aphanomyces root rot are evaluated in nurseries at the Spillman Research Farm and tolerance to fusarium root rot is evaluated at Prosser, WA. Reaction to fusarium wilt race 2 is being performed under controlled conditions in growth chambers at Pullman and has identified a number of elite breeding lines with resistance. Individual selections with resistance identified in these trials are being used to transfer their respective resistances to new varieties.

Table 5. Location Yield Summary (kg/ha) for the Advanced Marrowfat Dry Pea Yield Trial, 2006 (0633)

Cultivar	Origin	Leaf Type	Plant Type	Genesee	Pullman	Mean Seed Yield
PS03101328	X00P098	-	-	1618	2066	1842
PS02100740	X98P049	-	-	1430	2014	1722
PS02100726	X98P042	-	-	1534	1879	1707
PS02100725	X98P042	-	-	1630	1765	1698
PS02100739	X98P049	-	-	1387	1971	1679
PS02100735	X98P049	-	-	1458	1790	1624
GUIDO	…	+	-	1242	1986	1614
SUPRA*	…	-	-	1237	1881	1559
PS710909	X95P017	+	-	1345	1531	1438
PS01102929	X95P014	+	-	1375	1449	1412
PS99101364	X95P554	+	-	1288	1454	1371
PS9101365	X95P554	+	-	1250	1446	1348
Grand Mean				1399	1769	1584
C.V. (%)				10	6	8
LSD $_{(\alpha=0.05)}$				188	147	140
Planting Date				4/26/06	4/28/06	
Harvest Date				8/2/06	8/1/06	

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 of the two locations.
*Check variety.

Table 6. Agronomic Data for the Advanced Marrowfat Dry Pea Yield Trial, 2006 (0633)

Cultivar	Origin	FW	PM	Aphano-myces	PEMV	Days to Flower	Days to Maturity	Nodes to First Flower	Pods/ Peduncle	Mean Pod Ht (green)	Mean Pod Ht (mature)	Mean Pod Ht Index	Mean Plant Ht (green)	Mean Plant Ht (mature)	Mean Plant Ht Index	Rep Nodes	Weight 100 Seed
										..cm..	..cm..		..cm..	..cm..			..g..
PS03101328	X00P098	+	…	3.8	-	59	93	20	2	69	48	0.69	84	58	0.69	3	31.3
PS02100740	X98P049	+	…	4.5	-	59	94	19	2	49	43	0.88	61	56	0.91	3	32.1
PS02100726	X98P042	+	+	4.2	-	55	94	17	2	59	43	0.72	76	59	0.78	3	33.4
PS02100725	X98P042	+	+	4.0	-	55	93	16	2	60	46	0.78	72	60	0.84	3	32.3
PS02100739	X98P049	+	…	4.0	-	60	94	19	2	55	27	0.50	68	37	0.55	4	29.1
PS02100735	X98P049	+	+	4.2	-	54	91	15	2	48	41	0.85	65	58	0.90	4	33.7
GUIDO	…	+	+	3.2	-	49	91	16	2	48	12	0.26	62	27	0.45	3	33.3
SUPRA*	…	+	+	3.8	-	56	91	16	2	49	35	0.71	63	54	0.87	3	31.7
PS710909	X95P017	+	…	4.0	-	53	94	15	2	40	12	0.30	51	25	0.48	3	29.7
PS01102929	X95P014	+	…	4.3	+	50	90	13	2	43	12	0.30	62	27	0.45	3	28.8
PS99101364	X95P554	+	…	4.5	-	52	94	15	2	52	16	0.32	66	30	0.45	3	30.1
PS9101365	X95P554	+	…	4.7	-	51	94	15	2	52	15	0.30	69	29	0.43	3	30.7
Grand Mean				4.1		55	93	16	2	52	29	0.55	66	43	0.65	3	31.4
C.V. (%)				10.8		7	1	8	8	8	24	26.09	8	13	16.14	21	5.2
LSD (α=0.05)				0.6		5	2	2	0	6	10	0.20	7	8	0.15	1	0.0

FW = Fusarium wilt race 1; + = resistant, - = susceptible.
PM = Powdery mildew; + = susceptible, - = resistant.
Aphanomyces = Aphanomyces root rot; 1 = no symptoms, 2 = 20% of lower leaves symptomatic, 3 = 50% of leaves symptomatic and plant stunted, 4 = 80% of leaves symptomatic and plant stunted, 5 = all plants dead.
PEMV = Pea enation mosaic virus, + = resistant, - = susceptible.
Pod height was measured at the green pod stage and at harvest maturity. Pod height index was determined by dividing pod height at harvest maturity by the green pod height.
Plant height was measured at the green plant stage and at harvest maturity. Plant height index was determined by dividing plant height at harvest maturity by the green plant height.
Rep Nodes = average number of reproducing nodes on a plant.
Agronomic data are means of three replications at Pullman, WA.
*Check variety.

Table 7. Mean Yields of the Advanced Marrowfat Dry Pea Yield Trial, 2002- 2006

Cultivar	Origin	Leaf Type	Plant Type	2002		2003		2004		2005		2006	
				kg/ha	% check	kg/ha	% check	kg/ha	% check	kg/ha	% check	kg/ha	% check
PS03101328	X00P098	-	-	…	…	…	…	…	…	…	…	1842	118
PS02100740	X98P049	-	-	…	…	…	…	…	…	2501	110	1722	110
PS02100726	X98P042	-	-	…	…	…	…	…	…	…	…	1707	109
PS02100725	X98P042	-	-	…	…	…	…	…	…	…	…	1698	109
PS02100739	X98P049	-	-	…	…	…	…	…	…	2795	123	1679	108
PS02100735	X98P049	-	-	…	…	…	…	…	…	…	…	1624	104
GUIDO	…	+	-	1638	96	980	90	3480	102	2183	96	1614	104
SUPRA*	…	-	-	1712	100	1084	100	3400	100	2277	100	1559	100
PS710909	X95P017	+	-	1513	88	999	92	2705	80	2119	93	1438	92
PS01102929	X95P014	+	-	…	…	…	…	2924	86	2317	102	1412	91
PS99101364	X95P554	+	-	1382	81	624	58	2782	82	2044	90	1371	88
PS9101365	X95P554	+	-	1459	85	570	53	2591	76	1838	81	1348	87
Grand Mean				1365		771		2930		2255		1584	
LSD (α=0.05)				109		90		527		173		140	

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 in each year except 2005 and 2006.
*Check variety

Table 8. Agronomic and Yield Data for the Preliminary Yellow and Marrowfat Dry Pea Yield Trial, 2006 (0604)

Cultivar	Origin	Leaf Type	Plant Type	FW	PM	Aphano-myces	PEMV	Days to Flower	Days to Maturity	Nodes to First Flower	Pods/ Peduncle	Pod Ht (green)	Pod Ht (mature)	Pod Ht Index	Plant Ht (green)	Plant Ht (mature)	Plant Ht Index	Rep Nodes	Weight 100 Seed	Seed Yield
												..cm..	..cm..		..cm..	..cm..			..g..	..kg/ha..
Yellow Peas																				
PS04100710	X98P057	-	-	+/-	…	4.0	-	58	92	18	1	35	11	0.20	41	18	0.30	2	25.3	2885
PS04100129	X00P205	-	-	+	…	4.2	-	59	87	18	1	42	25	0.41	52	35	0.44	2	25.6	2803
REX	…	+	-	-	…	4.2	-	52	87	16	1	19	4	0.07	23	8	0.12	1	25.0	2746
PS04100927	X98P190	-	-	+	…	4.0	-	51	87	17	1	46	33	0.49	59	41	0.47	2	25.2	2651
PS04100796	X98P082	-	-	+/-	…	4.2	-	61	95	17	1	19	5	0.09	24	9	0.12	1	21.3	2607
PS04100179	X00P200	-	-	+/-	…	3.7	-	54	92	19	1	24	18	0.25	31	25	0.27	1	25.6	2606
UNIVERSAL	…	-	-	+/-	…	4.8	-	52	87	16	1	33	35	0.70	48	43	0.61	2	22.4	2605
PS04100083	X97P02	-	-	+	…	4.2	-	52	87	18	1	17	16	0.31	50	43	0.58	2	23.3	2552
PS04100818	X99P240	-	-	+	…	4.2	-	53	87	15	1	29	3	0.07	43	9	0.14	2	23.5	2548
PS04100910	X98P067	-	-	+	…	3.8	-	59	95	15	1	16	11	0.23	19	16	0.27	1	25.4	2502
PS04100076	X98P10	-	-	+	…	4.8	-	51	87	15	1	27	28	0.69	44	42	0.63	3	25.5	2466
PS04100922	X98P082	-	-	+	…	3.8	-	63	87	18	1	15	14	0.31	18	16	0.31	1	23.7	2352
PS01102958*	X96P124	-	-	+	-	4.3	-	60	92	18	1	32	31	0.64	40	38	0.64	2	23.5	2315
PS04100817	X99P240	-	-	+	…	4.0	-	56	90	20	1	25	18	0.23	31	22	0.24	1	26.9	2219
Sub-mean Yellow Peas						*4.2*		*56*	*89*	*17*	*1*	*27*	*18*	*0.34*	*37*	*26*	*0.37*	*2*	*24.4*	*2561*
Marrowfats																				
PS04100977	X00P096	-	-	+	…	3.7	-	59	95	19	1	47	41	0.58	58	52	0.59	2	29.7	2000
PS04100857	X98P046	-	-	+	…	4.8	-	52	95	15	1	18	9	0.17	24	13	0.18	1	32.2	1923
GUIDO	…	+	-	+	+	3.8	-	59	92	16	1	30	10	0.23	40	20	0.34	2	33.9	1919
SUPRA*	…	-	-	+	+	3.8	-	58	95	16	1	19	13	0.24	24	18	0.25	1	34.2	1866
PS03101789	X98P046	-	-	+	…	4.3	-	52	95	16	1	35	19	0.40	49	30	0.40	3	31.7	1864
PS04100884	X99P219	-	-	+	…	3.7	-	59	92	18	1	35	25	0.48	45	35	0.51	3	31.3	1556
PS04100977	X00P096	-	-	+	…	3.7	-	59	95	19	1	47	41	0.58	58	52	0.59	2	29.7	2000
Sub-mean Marrowfats						*4.0*		*57*	*94*	*17*	*1*	*31*	*19*	*0.35*	*40*	*28*	*0.38*	*2*	*32.2*	*1855*

Cultivar	Origin	Leaf Type	Plant Type	FW	PM	Aphano-myces	PEMV	Days to Flower	Days to Maturity	Nodes to First Flower	Pods/ Peduncle	Pod Ht (green)	Pod Ht (mature)	Pod Ht Index	Plant Ht (green)	Plant Ht (mature)	Plant Ht Index	Rep Nodes	Weight 100 Seed	Seed Yield
												..cm..	..cm..		..cm..	..cm..			..g..	..kg/ha..
Grand Mean						4.1		56	91	17	1	28	18	0.34	38	27	0.37	2	26.8	2349
C.V. (%)						10.1		2	3	9	61	63	78	77.82	59	67	63.41	70	14.3	6
LSD $_{(\alpha=0.05)}$						0.6		1	3	2	1	25	20	0.36	31	24	0.32	2	0.0	185

Planting date 4/28/06. Harvest date 8/1/06.
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; + = susceptible, - = resistant.
Aphanomyces = Aphanomyces root rot; 1 = no symptoms, 2 = 20% of lower leaves symptomatic, 3 = 50% of leaves symptomatic and plant stunted, 4 = 80% of leaves symptomatic and plant stunted, 5 = all plants dead.
PEMV = Pea enation mosaic virus, + = resistant, - = susceptible.
Pod height was measured at the green pod stage and at harvest maturity. Pod height index was determined by dividing pod height at harvest maturity by the green pod height.
Plant height was measured at the green plant stage and at harvest maturity. Plant height index was determined by dividing plant height at harvest maturity by the green plant height.
Rep Nodes = average number of reproducing nodes on a plant.
Agronomic and yield data are means of three replications at Pullman, WA.
*Check variety

Yellow Pea Trial Results

The advanced yellow pea yield trial comprised twelve breeding lines, two checks and two commercial entries (Table 9). Four breeding lines, PS02101229, PS0010836, PS03101822, and PS03100278 exceeded the mean check yield by 5 to 20 percent in 2006. Plant height index among entries (Table 10) in the trial ranged from 0.42 to a high of 1.00 (Delta and PS03690125). The breeding line PS01102958 produced seed yield at 88% of the check mean in 2006; however, due to its broad adaptation to production environments across the northern tier states and its outstanding seed quality a proposal for release of this line as variety is planned for the 2007 Washington State University Legume Variety Release Committee Meeting. Several breeding lines in the preliminary yield (Table 8) and observation trials (Table 12) produced outstanding yields and will be advanced into the advanced yield trial for wide testing across environments.

Disease Screening

All pea breeding lines are evaluated for resistance to disease in a network of nurseries across the PNW. Expansion of the disease screening effort will provide greater efficiencies in developing improved pea breeding lines with multiple disease resistance applicable to all US production regions. Resistance to pea enation mosaic virus is evaluated at Corvallis, OR, resistance to fusarium wilt race 1 and tolerance to aphanomyces root rot are evaluated in nurseries at the Spillman Research Farm and tolerance to fusarium root rot is evaluated at Prosser, WA. Reaction to fusarium wilt race 2 is being performed under controlled conditions in growth chambers at Pullman and has identified a number of elite breeding lines with resistance. Individual selections with resistance identified in these trials are being used to transfer their respective resistances to new varieties.

Variety Releases

PS01102958, a yellow cotyledon spring pea has broad adaptation, excellent agronomic performance and outstanding seed quality. The initial lot of pre-breeder seed was planted on approximately 0.25 acres at WSU Spillman Research Farm and produced 500 lbs of breeder seed. Following release this seed will be turned over to the cooperating state Foundation Seed Programs for production and distribution of Foundation seed.

Table 9. Location Yield Summary (kg/ha) for the Advanced Yellow Pea Yield Trial, 2006 (0602)

Cultivar	Origin	Leaf Type	Plant Type	Genesee	Pullman	Walla Walla	Mean Seed Yield
PS03101822	X96P126	-	-	2532	2855	3542	2976
PS02101229	X98P067	-	-	2486	2769	2950	2735
PS0010836	SH95-6-1	-	-	2275	2453	3362	2696
PS03100278	BXM95P10-111	-	-	2476	2540	2832	2616
CAROUSEL	...	-	-	2040	2713	3029	2594
UNIVERSAL	...	-	-	2314	2405	2922	2547
PS02101119	X96P122	-	-	2122	2574	2895	2530
PS03690125	X98P092	-	-	2055	2461	2992	2503
PS03100280	BXM95P10-111	-	-	2393	2529	2475	2466
PS03690134	X98P161	-	-	1964	2386	3046	2465
PS03101815	X96P126	-	-	2171	2443	2741	2451
DELTA*	...	-	-	1827	2222	3208	2419
PS02101137	X96P127	-	-	1790	2554	2894	2413
PS03101847	X96P130	-	-	2002	2384	2496	2294
PRO 007	...	-	-	1965	2451	2424	2280
PS01102958	X96P124	-	-	1590	2410	2571	2191
Grand Mean				2125	2509	2899	2511
C.V. (%)				8	5	8	7
LSD $_{(\alpha=0.05)}$				238	172	308	166
Planting Date				4/26/06	4/28/06	4/24/06	
Harvest Date				8/2/06	7/3106	8/8/06	

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 of the three locations.
*Check variety.

Table 10. Agronomic Data for the Advanced Yellow Dry Pea Yield Trial, 2006 (0602)

Cultivar	Origin	FW	Aphano-myces	PEMV	Days to Flower	Days to Maturity	Nodes to First Flower	Pods/ Peduncle	Mean† Pod Ht (green)	Mean Pod Ht (mature)	Mean Pod Ht Index	Mean† Plant Ht (green)	Mean Plant Ht (mature)	Mean Plant Ht Index	Rep Nodes	Weight 100 Seed
									..cm..	..cm..		..cm..	..cm..			..g..
PS03101822	X96P126	+	3.8	-	51	87	15	2	41	24	0.59	58	40	0.68	3	23.0
PS02101229	X98P067	+	3.7	-	57	87	19	2	50	26	0.52	64	44	0.71	3	22.5
PS0010836	SH95-6-1	+	3.8	-	56	87	17	2	43	30	0.69	56	41	0.73	4	25.3
PS03100278	BXM95P10-111	+	3.3	-	51	87	17	2	47	41	0.89	72	61	0.87	4	22.9
CAROUSEL	…	-	3.5	…	53	86	19	2	62	52	0.86	71	67	0.90	3	24.0
UNIVERSAL	…	+/-	4.5	-	53	87	19	2	48	46	0.97	67	61	0.96	4	21.9
PS02101119	X96P122	+	4.0	-	54	87	18	2	55	23	0.44	69	33	0.48	3	25.1
PS03690125	X98P092	+	3.8	-	51	87	18	2	43	48	1.13	60	59	1.01	3	25.5
PS03100280	BXM95P10-111	+	3.7	-	52	87	19	2	52	40	0.76	75	55	0.77	4	22.9
PS03690134	X98P161	+	4.0	-	53	87	16	2	37	16	0.43	54	27	0.48	3	22.9
PS03101815	X96P126	+	4.0	-	51	86	14	2	36	18	0.51	59	31	0.52	4	24.7
DELTA*	…	+	4.0	-	56	87	20	2	50	48	0.95	60	62	1.01	3	21.3
PS02101137	X96P127	+	4.0	-	59	87	20	2	61	44	0.72	73	58	0.78	3	23.2
PS03101847	X96P130	+	4.2	-	51	87	14	2	47	18	0.39	71	30	0.42	4	25.1
PRO 007	…	+	3.8	…	56	87	20	2	58	49	0.84	75	62	0.82	5	24.3
PS01102958	X96P124	+	3.7	-	58	87	18	2	45	33	0.73	57	51	0.89	4	24.1
Grand Mean			3.9		54	87	18	2	48	35	0.71	65	49	0.75	4	23.7
C.V. (%)			10.1		2	1	6	…	8	15	18.91	4	10	10.88	13	5.2
LSD (α=0.05)			0.5		1	1	1	…	5	7	0.19	4	7	0.11	1	

FW = Fusarium wilt race 1; + = resistant, - = susceptible.

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

Aphanomyces = Aphanomyces root rot; 1 = no symptoms, 2 = 20% of lower leaves symptomatic, 3 = 50% of leaves symptomatic and plant stunted, 4 = 80% of leaves symptomatic and plant stunted, 5 = all plants dead.

PEMV = Pea enation mosaic virus, + = resistant, - = susceptible.

Pod height was measured at the green pod stage and at harvest maturity. Pod height index was determined by dividing pod height at harvest maturity by the green pod height.

Plant height was measured at the green plant stage and at harvest maturity. Plant height index was determined by dividing plant height at harvest maturity by the green plant height.

Rep Nodes = average number of reproducing nodes on a plant.

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

*Check variety.

Table 11. Mean Yields of the Advanced Yellow Dry Pea Yield Trial, 2002 - 2006

Cultivar	Origin	Leaf Type	Plant Type	2002		2003		2004		2005		2006	
				kg/ha	% check	kg/ha	% check	kg/ha	% check	kg/ha	% check	kg/ha	% check
PS03101822	X96P126	-	-	…	…	…	…	…	…	…	…	2976	123
PS02101229	X98P067	-	-	…	…	…	…	…	…	2740	104	2735	113
PS0010836	SH95-6-1	-	-	…	..	1804	110	4050	99	2664	101	2696	112
PS03100278	BXM95P10-111	-	-	…	…	…	…	…	…	…	…	2616	108
CAROUSEL	…	-	-	…	…	…	…	…	…	…	…	2594	107
UNIVERSAL	…	-	-	…	…	…	…	…	…	…	…	2547	105
PS02101119	X96P122	-	-	…	…	…	…	…	…	2554	97	2530	105
PS03690125	X98P092	-	-	…	…	…	…	…	…	…	…	2503	103
PS03100280	BXM95P10-111	-	-	…	…	…	…	…	…	…	…	2466	102
PS03690134	X98P161	-	-	…	…	…	…	…	…	…	…	2465	102
PS03101815	X96P126	-	-	…	…	…	…	…	…	…	…	2451	101
DELTA*	…	-	-	2270	100	1639	100	4083	100	2641	100	2419	100
PS02101137	X96P127	-	-	…	…	…	…	…	…	2213	84	2413	100
PS03101847	X96P130	-	-	…	…	…	…	…	…	…	…	2294	95
PRO 007	…	-	-	…	…	…	…	…	…	…	…	2280	94
PS01102958	X96P124	-	-	…	…	…	…	3555	87	2515	95	2191	91
Grand Mean				2048		1651		3799		2466		2511	
LSD (α=0.05)				112		91		471		141		166	

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 in each year except 2005 and 2006.
*Check variety

Table 12. Agronomic and Yield Data for the Preliminary Green, Yellow and Marrowfat Dry Pea Observation Trial, 2006 (0605)

Cultivar	Origin	Leaf Type	Plant Type	Days to Flower	Days to Maturity	Nodes to First Flower	Pod/ Peduncle	Pod Ht (green)	Pod Ht (mature)	Pod Ht Index	Plant Ht (green)	Plant Ht (mature)	Plant Ht Index	Rep Nodes	Weight 100 Seed	Seed Yield
								..cm..	..cm..		..cm..	..cm..			..g..	..kg/ha..
							Green Peas									
PS05100736	X00P130	-	-	58	87	18	2	60	45	0.76	74	59	0.80	3	21.7	3118
PS05100508	…	-	-	58	87	20	2	60	52	0.87	73	61	0.84	3	22.5	2759
PS05100350	…	+	-	56	84	18	2	68	23	0.34	81	33	0.41	3	19.5	2713
PS05100728	X00P120	-	-	58	91	18	2	53	49	0.92	64	60	0.94	3	24.4	2407
PS05100655	X00P096	-	-	56	87	19	2	71	27	0.37	76	35	0.46	2	21.7	2405
PS05100632	X00P082	-	-	48	84	19	2	59	3	0.04	70	65	0.94	3	20.5	2403
PS05100860	X01P-0137	-	-	58	87	18	2	39	34	0.86	50	45	0.90	3	19.5	2399
PS05100640	X00P082	-	-	49	84	18	2	57	66	1.16	67	79	1.18	3	20.7	2393
PS05100522	X00P111	-	-	49	84	17	2	63	52	0.83	71	64	0.89	2	22.1	2388
PS05100735	X00P130	-	-	58	87	18	2	43	43	1.00	51	53	1.04	2	22.4	2388
PS05100120	…	-	-	58	87	20	2	63	28	0.44	74	39	0.53	3	19.4	2378
PS05200040	…	+	-	53	84	16	2	54	19	0.36	66	27	0.41	3	22.5	2378
PS05100835	X00P183	-	-	58	87	23	2	54	48	0.88	67	59	0.89	3	21.2	2341
PS05100816	X00P168	-	-	49	87	18	2	62	24	0.39	74	40	0.54	3	23.7	2330
PS05100513	X00P111	-	-	49	84	17	2	57	50	0.87	70	60	0.86	2	22.3	2324
PS05200027	…	-	-	56	87	23	2	62	53	0.86	79	72	0.91	4	26.0	2287
PS05100596	X00P068	-	-	58	91	17	2	35	27	0.76	56	39	0.69	5	24.2	2262
PS05100840	X00P183	-	-	58	87	21	2	62	54	0.86	71	64	0.90	2	20.9	2252
PS05100195	…	-	-	49	84	16	2	59	35	0.59	75	49	0.65	3	...	2248
PS05100777	X00P149	-	-	58	91	18	2	66	48	0.73	78	59	0.76	3	25.7	2223
PS05100426	….	+/-	-	58	87	19	2	63	...	...	75	...	...	3	...	2217
PS05100836	X00P183	-	-	56	87	22	2	61	47	0.77	71	58	0.82	2	23.1	2196
PS05100727	X00P120	-	-	58	91	19	2	59	31	0.52	67	45	0.67	2	23.2	2175
PS05100670	X00P102	-	-	58	87	18	2	49	31	0.63	65	44	0.67	4	24.2	2159
PS05100733	X00P124	-	-	56	91	21	2	66	27	0.41	74	35	0.47	3	20.0	2124
PS05100440	…	-	-	58	87	22	2	68	44	0.64	77	58	0.75	2	23.2	2107
PS05100629	X00P082	-	-	58	87	18	2	58	32	0.54	73	46	0.62	4	20.1	2101
PS05100684	X00P104	-	-	49	87	12	2	39	32	0.81	81	48	0.60	8	24.9	2086
PS05100414	…	+	-	58	91	19	2	61	25	0.40	69	32	0.46	2	22.2	2082
PS05100564	X00P013	-	-	51	91	11	2	31	36	1.15	60	51	0.84	8	23.3	2078
PS05100523	X00P111	-	-	49	84	16	2	55	50	0.92	71	63	0.88	3	21.9	2041
PS05100048	…	-	-	51	87	20	2	59	48	0.81	69	60	0.88	2	23.2	2020
PS05100710	X00P111	-	-	54	87	17	2	44	32	0.73	58	45	0.78	3	21.4	1993
PS05100614	X00P079	-	-	51	84	17	2	55	26	0.48	69	48	0.70	4	21.8	1981

Cultivar	Origin	Leaf Type	Plant Type	Days to Flower	Days to Maturity	Nodes to First Flower	Pod/ Peduncle	Pod Ht (green)	Pod Ht (mature)	Pod Ht Index	Plant Ht (green)	Plant Ht (mature)	Plant Ht Index	Rep Nodes	Weight 100 Seed	Seed Yield
								..cm..	..cm..		..cm..	..cm..			..g..	..kg/ha..
Green Peas Continued																
PS05100577	X00P031	-	-	58	91	19	2	53	28	0.52	70	45	0.64	4	21.4	1977
PS05100627	X00P081	-	-	58	87	16	2	41	45	1.10	53	56	1.06	4	25.1	1960
PS05100519	X00P111	-	-	51	87	18	2	55	31	0.57	72	48	0.66	3	22.2	1950
PS05100847	X00P210	-	-	58	87	22	2	74	56	0.76	93	69	0.74	5	26.8	1909
PS05100582	X00P039	-	-	58	91	20	2	64	40	0.62	75	52	0.69	3	25.8	1803
PS05100806	X00P164	-	-	60	87	20	2	53	40	0.76	63	56	0.89	3	22.2	1764
PS05100802	X00P161	-	-	58	87	21	2	61	51	0.83	74	63	0.86	4	24.4	1727
PS05100748	X00P143	-	-	58	87	21	2	56	45	0.81	67	56	0.84	3	21.8	1658
PS05100443	…	-	-	58	87	18	2	47	46	0.99	58	57	0.98	2	23.9	1644
PS05100575	X00P027	-	-	48	87	21	2	58	33	0.57	79	47	0.59	3	23.8	1634
PS05100778	X00P149	-	-	58	91	18	2	49	44	0.90	59	67	1.15	3	25.2	1565
PS05100518	X00P111	-	-	49	91	16	2	53	35	0.65	65	52	0.80	2	23.1	1454
PS05100579	X00P039	-	-	61	91	21	2	52	44	0.84	62	65	1.05	2	25.5	1429
PS05100762	X00P146	-	-	61	91	20	2	41	36	0.92	51	42	0.82	3	22.6	1373
PS05100524	X00P111	-	-	51	91	16	2	46	25	0.54	70	51	0.73	6	...	1268
PS05100764	X00P146	-	-	48	87	16	2	42	42	1.01	64	60	0.94	7	24.7	1257
PS05100555	X99P235	-	-	56	91	19	2	61	22	0.35	72	31	0.42	3	...	1009
PS05100677	X00P103	-	-	58	91	15	2	44	35	0.80	68	54	0.79	7	...	755
Sub-mean Green Peas				*55*	*88*	*18*	*2*	*55*	*37*	*0.70*	*69*	*52*	*0.76*	*3*	*22.8*	*2036*
Red Peas																
PS05100925	X01P-0202	-	-	58	87	18	2	49	44	0.90	57	56	0.97	3	24.4	2680
PS05100990	X01P-0239	-	-	54	81	16	2	56	25	0.45	67	45	0.67	3	23.8	2641
PS05100967	X01P-0237	-	-	54	84	17	2	45	40	0.89	54	48	0.89	3	26.3	2637
PS05100993	X01P-0239	-	-	58	87	18	2	40	16	0.39	50	24	0.48	3	26.6	2252
PS05100914	X01P-0172	-	-	58	87	18	2	43	43	1.00	52	55	1.06	3	24.3	2144
PS05100929	X01P-0202	-	-	56	87	18	2	47	30	0.65	57	40	0.70	4	22.9	2115
PS05100936	X01P-0202	-	-	58	87	16	2	35	30	0.86	46	42	0.92	3	22.4	2084
PS05100965	X01P-0237	-	-	56	87	16	2	37	32	0.86	47	44	0.94	2	26.3	1981
PS05100944	X01P-0230	-	-	58	87	14	2	32	33	1.03	40	42	1.06	2	22.1	1590
Sub-mean Red Peas				*57*	*86*	*16*	*2*	*42*	*32*	*0.78*	*52*	*44*	*0.85*	*3*	*24.3*	*2236*

Cultivar	Origin	Leaf Type	Plant Type	Days to Flower	Days to Maturity	Nodes to First Flower	Pod/ Peduncle	Pod Ht (green)	Pod Ht (mature)	Pod Ht Index	Plant Ht (green)	Plant Ht (mature)	Plant Ht Index	Rep Nodes	Weight 100 Seed	Seed Yield
								..cm..	..cm..		..cm..	..cm..			..g..	..kg/ha..
Yellow Peas																
PS05100006		-	-	48	84	16	2	66	42	0.63	87	51	0.58	3	22.1	3015
PS05200022		-	-	49	84	14	2	48	31	0.65	76	41	0.54	5	22.5	2934
PS05101158	X01P-0198	-	-	56	84	20	2	55	54	0.98	68	63	0.93	4	25.1	2883
PS05100447		-	-	60	83	21	2	73	52	0.71	84	64	0.76	3	25.1	2707
PS05200026		-	-	49	84	16	2	57	36	0.64	69	47	0.68	3	24.1	2701
PS05100228		-	-	49	81	18	2	61	21	0.34	73	28	0.39	3	25.8	2684
PS05200227				48	84	13	2	43	26	0.60	64	45	0.70	2	21.9	2628
PS05100446		-	-	59	87	20	2	69	30	0.43	75	41	0.54	3	25.2	2618
PS05200016		+	-	49	84	17	2	52	23	0.44	63	35	0.56	4	25.7	2583
PS05101139	X01P-0183	-	-	51	84	21	2	64	38	0.59	75	49	0.65	4	23.2	2537
PS05200021		-	-	56	84	18	2	52	34	0.65	58	43	0.73	3	28.0	2498
PS05200015		+	-	52	84	17	2	52	26	0.50	73	36	0.49	4	25.2	2461
PS05200028		-	-	58	83	20	2	60	51	0.84	75	60	0.80	3	21.1	2455
PS05101157	X01P-0198	-	-	58	87	20	2	64	33	0.52	77	46	0.59	4	26.1	2440
PS01102958	X96P124			53	85	16	2	49	24	0.45	63	38	0.58	4	23.3	2307
PS05200011		+	-	58	87	17	2	45	28	0.61	58	38	0.65	3	...	2411
PS05200042		+	-	49	84	12	2	51	23	0.46	71	34	0.48	5	22.8	2355
PS05200029		-	-	58	84	20	2	60	49	0.82	73	62	0.85	3	21.2	2335
PS05101257	X01P-0237	-	-	56	84	19	2	47	18	0.37	57	48	0.84	2	25.8	2330
PS05200025		-	-	49	84	15	2	53	37	0.70	68	57	0.84	4	23.1	2291
PS05100495		+	-	49	84	15	2	49	17	0.35	61	28	0.46	4	25.9	2279
PS05101240	X01P-0229	-	-	58	87	16	2	37	...	...	47	...	...	4	20.9	2250
PS05100098		-	-	56	84	20	2	65	49	0.75	76	61	0.80	2	24.4	2248
PS05101146	X01P-0194	-	-	56	84	16	2	43	21	0.49	56	32	0.57	2	21.8	2192
PS05200024		-	-	51	84	14	2	48	30	0.63	76	45	0.59	5	...	2155
PS05100218				56	84	21	2	63	25	0.39	75	33	0.44	4	21.8	2153
PS05101142	X01P-0187	-	-	58	87	17	2	54	32	0.60	69	45	0.65	4	20.4	2149
PS05100170		-	-	56	84	19	2	60	23	0.38	70	38	0.55	3	24.3	2055
PS05101038	X00P152	-	-	59	87	18	2	61	57	0.93	74	69	0.93	3	27.4	2051
PS05101039	X00P152	-	-	58	87	20	2	61	66	1.07	71	71	1.00	3	27.9	1975
PS05200031		-	-	51	84	16	2	53	...	...	71	...	...	4	...	1751
PS05101220	X01P-0220	-	-	56	87	18	2	58	31	0.53	74	42	0.57	5	...	1530
Sub-mean Yellow Peas				*54*	*85*	*17*	*2*	*55*	*32*	*0.56*	*69*	*43*	*0.62*	*3*	*24.0*	*2374*

Cultivar	Origin	Leaf Type	Plant Type	Days to Flower	Days to Maturity	Nodes to First Flower	Pod/ Peduncle	Pod Ht (green)	Pod Ht (mature)	Pod Ht Index	Plant Ht (green)	Plant Ht (mature)	Plant Ht Index	Rep Nodes	Weight 100 Seed	Seed Yield
								..cm..	..cm..		..cm..	..cm..			..g..	..kg/ha..
Marrowfats																
PS04100869	X98P046	-	-	51	87	16	2	52	20	0.38	81	36	0.44	4	33.0	1832
PS04100883	X99P219	-	-	53	87	15	2	49	16	0.32	63	24	0.38	4	37.4	1714
PS04100878	X98P049	-	-	56	87	17	2	56	41	0.73	68	49	0.71	3	32.6	1665
PS04100885	X99P219	-	-	58	91	19	2	57	34	0.60	69	39	0.56	4	34.8	1336
Sub-means Marrowfats				*55*	*88*	*17*	*2*	*53*	*28*	*0.51*	*70*	*37*	*0.52*	*4*	*34.5*	*1637*
International Exchange																
BACCARA		-	-	53	84	14	2	42	34	0.82	53	48	0.90	3	26.3	2800
SOLARA		-	-	51	87	16	2	42	34	0.81	58	44	0.76	5	24.5	2339
GSP-Ae-B9704-723		-	-	51	84	15	2	50	14	0.28	76	24	0.32	4	22.5	2266
DRUJBA		-	-	58	84	19	2	59	49	0.82	74	66	0.89	3	20.3	2266
Gp3260		-	-	51	84	15	2	42	26	0.63	52	40	0.76	3	25.4	2240
CAPELLA		-	-	54	84	18	1	52	17	0.33	65	35	0.54	3	20.1	2198
GSP-Ae-B9704-730		-	-	56	87	13	2	44	7	0.15	58	12	0.20	4	21.0	2146
GSP-Ae-D9904-15		-	-	53	87	15	2	50	11	0.21	67	18	0.27	4	22.5	2115
GSP-Ae-D9904-14		-	-	56	87	15	2	44	8	0.17	59	19	0.32	3	22.8	2078
FRILENE		+	-	56	84	14	2	39	1	0.03	47	12	0.26	3	18.8	2068
GSP-Ae-B9704-724-a		-	-	54	92	17	2	65	8	0.12	80	17	0.21	4	22.3	2049
GSP-Ae-B9704-710		-	-	58	87	17	2	32	1	0.03	41	7	0.17	3	19.9	1996
GSP1070		+	-	56	87	17	2	67	3	0.04	95	16	0.16	5	17.1	1909
ONAVARD		-	-	49	87	16	2	50	50	0.99	76	63	0.83	6	24.7	1905
GSP-Ae-B9704-722		-	-	56	84	18	3	43	15	0.35	52	21	0.40	3	19.9	1880
GSP-Ae-B9704-709		-	-	58	87	18	2	41	1	0.02	50	9	0.18	2	18.9	1876
Gp2459		+/-	+	56	91	16	2	89	8	0.09	106	21	0.19	3	32.1	1867
GSP-Ae-B9704-740		+	-	49	87	12	2	46	5	0.11	62	14	0.23	4	19.9	1805
GSP-Ae-D9904-3sp		+	-	60	91	19	2	54	5	0.09	63	19	0.29	3	19.2	1745
GSP-Ae-D9904-18f		+/-	-	56	87	16	2	49	9	0.17	68	18	0.26	5	23.1	1706
GSP-Ae-B9704-712		-	-	56	84	19	2	45	4	0.08	52	12	0.22	3	17.7	1640
GSP920		+	-	51	87	15	1	51	5	0.09	67	15	0.23	3	19.7	1621
GSP-Ae-D9904...		-	-	49	91	16	2	38	7	0.17	48	11	0.23	3	20.9	1592
GSP-Ae-D9904-17		-	-	56	91	15	2	53	7	0.13	67	14	0.20	5	22.7	1588
Gp3256		+	+	48	91	12	1	46	11	0.24	122	26	0.21	6	32.8	1563
GSP-Ae-D9904-4		+	-	63	91	21	1	66	10	0.15	73	20	0.27	3	19.0	1487

Cultivar	Origin	Leaf Type	Plant Type	Days to Flower	Days to Maturity	Nodes to First Flower	Pod/ Peduncle	Pod Ht (green)	Pod Ht (mature)	Pod Ht Index	Plant Ht (green)	Plant Ht (mature)	Plant Ht Index	Rep Nodes	Weight 100 Seed	Seed Yield
								..cm..	..cm..		..cm..	..cm..			..g..	..kg/ha..
International Exchange Continued																
Gp2459		+/-	+	56	91	19	2	92	12	0.13	116	22	0.19	3	24.5	1470
Gp3257		+	+	62	91	19	1	112	12	0.10	137	28	0.20	2	27.1	1466
GSP-Ae-B9704-738		+	-	49	87	12	2	33	1	0.03	52	17	0.32	5	21.2	1450
GSP923		+	+	58	91	21	2	111	17	0.15	140	29	0.20	4	15.7	1421
Gp3148		+	+	56	91	18	1	112	12	0.11	133	27	0.20	4	30.7	1340
GSP-Ae-D9904-7		-	-	49	91	11	2	29	6	0.21	48	16	0.32	6	23.8	1332
GSP-Ae-B9704-739		+	-	49	87	12	2	36	1	0.03	58	14	0.23	4	21.3	1187
GSP-Ae-D9904-8v		-	-	53	92	22	2	53	5	0.10	64	15	0.23	4	22.4	1017
GSP-Ae-D9904-6		-	-	51	92	16	2	43	9	0.20	56	18	0.32	5	21.1	997
Gp3257		+	+	62	91	21	1	113	20	0.18	137	38	0.27	2	21.8	964
Sub-means International Exchange				*54*	*88*	*16*	*2*	*56*	*12*	*0.23*	*74*	*23*	*0.33*	*4*	*22.3*	*1761*
Grand Mean				55	87	17	2	54	30	0.57	69	41	0.61	3	23.4	2045

Leaf type; + = normal leaf, - = *afila* or semileafless type.
Plant type; + = tall plant type, - = short plant type.
Pod height was measured at the green pod stage and at harvest maturity. Pod height index was determined by dividing pod height at harvest maturity by the green pod height.
Plant height was measured at the green plant stage and at harvest maturity. Plant height index was determined by dividing plant height at harvest maturity by the green plant height.
Rep Nodes = average number of reproducing nodes on a plant.
Agronomic data and seed yield data are one replication at Pullman, WA.

Cultivar	Leaf Type	Plant Type	FW	Aphano -myces	PEMV	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..
CDC-715-4	-	-	+	3.8	-	61	90	17	2	47	27	0.60	58	54	0.95	3	22.0	2913
CDC-0105	-	-	+/-	4.0	+	55	86	20	2	53	28	0.53	64	56	0.88	3	20.1	2885
96-235*5	+	-	…	4.0	-	55	85	16	2	50	9	0.18	69	23	0.34	4	20.8	2682
1410-15	-	-	…	4.0	-	58	86	20	2	70	42	0.60	83	75	0.90	3	20.0	2664
1330-7	-	-	…	3.5	-	59	87	19	2	56	27	0.51	68	47	0.74	3	20.7	2662
CDC-0107	-	-	+	3.8	-	58	91	17	2	47	34	0.71	64	57	0.89	4	17.4	2661
985-23	-	-	…	3.7	-	61	87	20	2	52	28	0.54	64	48	0.77	4	20.6	2618
92-190-*5-6	-	-	+	3.5	-	55	86	20	2	60	31	0.52	73	58	0.79	3	20.3	2607
CDC-VERDI	-	-	+	3.5	-	60	90	20	2	56	32	0.57	69	62	0.91	4	20.0	2600
CDC-0108	-	-	+	4.0	-	60	90	18	2	57	34	0.61	68	60	0.89	3	21.4	2586
CDC-0102	-	-	+	3.3	-	56	86	17	2	43	19	0.44	59	40	0.68	4	19.6	2563
96-049*1	-	-	…	4.0	-	56	90	16	2	60	16	0.27	81	38	0.49	4	21.2	2547
CDC-653-8	-	-	+	3.8	-	58	85	19	2	64	45	0.71	77	66	0.86	4	18.4	2544
92-218*9*6	-	-	+/-	3.3	-	58	91	21	2	68	24	0.37	80	56	0.71	4	21.9	2535
92-208-*12	-	-	+	3.5	-	56	90	17	2	58	30	0.54	78	61	0.79	4	19.4	2526
93-062*14	-	-	+	3.7	-	50	87	17	2	50	22	0.47	77	47	0.62	4	19.5	2507
CDC-647-1	-	-	+	3.8	-	60	91	19	2	56	29	0.51	69	57	0.84	3	18.7	2478
EXCELL	-	-	+	3.8	-	56	88	17	2	71	24	0.35	87	57	0.65	3	23.9	2462
1370-5	-	-	…	3.8	-	59	59	20	2	56	37	0.66	70	61	0.89	3	19.5	2434
89-036-*9-2	-	-	+	4.2	-	56	87	19	2	61	25	0.41	79	54	0.70	4	21.8	2400
96-262*1	-	-	…	3.8	-	58	86	18	2	64	15	0.24	72	28	0.39	2	20.8	2359
92-254-*7-6	-	-	+	4.0	-	51	85	16	2	55	12	0.24	69	29	0.44	3	20.1	2299
1434-20	-	-	…	3.7	-	61	61	21	2	62	35	0.56	75	66	0.88	3	19.0	2299
89-036-*9-10	-	-	+	4.2	-	56	87	18	2	56	20	0.35	70	41	0.60	4	20.5	2256
90-158*8-5	-	-	+	4.2	-	58	88	20	2	62	41	0.68	75	72	0.96	3	23.1	2188
89-036-*9-8	-	-	+	4.2	-	58	86	19	2	56	20	0.37	71	37	0.57	4	19.9	2170
1503-3	-	-	…	3.5	-	60	30	19	2	52	37	0.71	68	58	0.85	4	18.3	2162
92-112-*1-3	-	-	+	4.2	-	54	87	17	2	59	12	0.20	70	24	0.34	3	18.3	2094

Cultivar	Leaf Type	Plant Type	FW	Aphano -myces	PEMV	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..
90-166*30-5	-	-	+	4.0	-	60	61	20	2	69	37	0.53	87	68	0.78	4	24.5	1936
97-297*10-1	-	-	...	3.5	-	57	0	16	2	46	13	0.30	63	19	0.30	4	20.9	1921
Grand Mean				3.8		57	80	18	2	57	27	0.48	72	51	0.71	3	20.4	2452
C.V. (%)				10.2		2	24	7	8	9	22	22.97	7	12	13.10	19	7.8	9
LSD $_{(\alpha=0.05)}$				0.5		1	26	2	0	7	8	0.15	7	9	0.13	1	0.0	287

Planting date was 5/1/06. Harvest date was 8/3/06.

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

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

FW = Fusarium wilt race 1; + = resistant, - = susceptible.

Aphanomyces = Aphanomyces root rot; 1 = no symptoms, 2 = 20% of lower leaves symptomatic, 3 = 50% of leave symptomatic and plant stunted, 4 = 80% of leaves symptomatic and plant stunted, 5 = all plants dead.

PEMV = Pea enation mosaic virus, + = resistant, - = susceptible.

Pod height was measured at the green pod stage and at harvest maturity. Pod height index was determined by dividing pod height at harvest maturity by the green pod height.

Plant height was measured at the green plant stage and at harvest maturity. Plant height index was determined by dividing plant height at harvest maturity by the green plant height.

Rep Nodes = average number of reproducing nodes on a plant.

Agronomic and yield data are means of three replications at Pullman, WA

Winter Pea Trial Results

The white-flowered, clear-seeded, winter feed pea yield trial included eleven breeding lines, three checks and two commercial entries and was planted at three locations in 2006, WSU Spillman Farm and the Joe Schmitz farm near Rosalia, WA and on the Boyd Farm near Genesee, ID. Establishment of the trials at Genesee and Rosalia were unsatisfactory requiring that both sites be abandoned. Winter conditions resulted in differential killing of less hardy breeding lines. Spring checks planted among the trials were largely killed.

The seventeen breeding lines in the advanced yield trial comprised six green cotyledon types and five yellow cotyledon types. The check lines, ‘Specter’, ‘Windham’ and ‘Whistler’, had yellow cotyledons. Four of the entries were long vine types and the remaining were semi-dwarf types and three entries possessed conventional leaf morphology. Seed yield at Spillman Farm averaged 2694 kg/ha and yield ranged from 1401 to 3370 kg/ha.

Specter was released in 2005 and continues to perform well in trials across the Palouse as well as trials in Montana. This variety was released as a winter feed pea due to the presence of ‘ghost’ mottling on the seed coat and small seed size, making it less desirable for traditional human food markets. Specter has yellow cotyledons and a long vine plant type with semi-leafless leaf morphology. Seed distribution of Specter has been turned over to the Washington State Crop Improvement Association and is being grown in several states.

Windham, selection PS9830S358, was selected for release in 2006 for its broad adaptation to PNW and Midwest environments, particularly Montana. Release of this breeding line is expected to compliment that of Specter due to the contrasting vine types. This will allow growers to choose the plant type that specifically fits their farming system and objectives. Breeder seed was produced on approximately 0.5 acre at WSU Spillman Research Farm during the 2006 crop season. This seed will be distributed to interested state Foundation Seed Programs for production of foundation seed. Foundation seed should be available to producers for planting in the fall of 2007.

The winter pea preliminary observation trial included 20 breeding lines and both green and yellow cotyledon types were represented. Differential winter survival allowed elimination of less hardy types. Seed yield ranged from 66 to 3164 kg/ha with a mean seed yield of 1756 kg/ha. Selected lines with superior performance will be advanced and tested in regional trials in 2007.

Table 14. Agronomic Data for the Advanced Austrian Winter Type Dry Pea Yield Trial, 2006 (0621)

Cultivar	Origin	Leaf Type	Plant Type	FW	PM	Aphano-myces	Nodes to First Flower	Mean Pods/ Peduncle	Mean Pod Ht (green)	Mean Pod Ht (mature)	Mean Pod Ht Index	Mean Plant Ht (green)	Mean Plant Ht (mature)	Mean Plant Ht Index	Mean Rep Nodes	Mean Weight 100 Seed	Mean Seed Yield
									..cm..	..cm..		..cm..	..cm..			..g..	..kg/ha..
GLACIER	…	+	-	+	+	3.3	19	2	34	5	0.15	64	22	0.35	4	12.5	1825
PS0230F274	X97P051	-	+	+	+	3.5	18	2	82	7	0.09	143	29	0.20	5	15.2	1801
PS0230F249	X95P672	-	+	+/-	+	3.3	18	2	83	10	0.12	146	24	0.17	5	14.2	1795
PS0230F352	X97P100	-	+	+	+	3.7	21	2	91	10	0.11	154	29	0.19	5	13.4	1779
PS0230F257	X95P672	-	+	+	+	3.5	19	2	92	10	0.11	151	27	0.19	5	13.8	1665
PS0230F256	X95P672	-	+	+	+	3.7	20	2	81	8	0.10	156	29	0.19	6	14.0	1661
FENN	…	+	+	-	+	3.3	20	2	84	10	0.12	149	24	0.17	6	11.4	1561
GRANGER	…	-	+	+	+	3.7	20	2	86	9	0.11	143	20	0.14	5	13.3	1484
MELROSE	…	+	+	-	+	3.5	23	2	100	13	0.13	166	24	0.14	5	11.6	1460
PS03100675	X95P672	-	+	+	+	3.5	16	2	77	12	0.18	129	33	0.27	4	13.9	1421
ROMACK	…	+	+	+/-	+	3.2	18	2	74	14	0.19	148	33	0.23	6	13.1	1377
Grand Mean						3.5	19	2	80	10	0.13	141	27	0.20	5	13.3	1621
C.V. (%)						8.9	12	21	16	26	35.09	9	35	39.71	26	2.8	12
LSD $_{(\alpha=0.05)}$						0.4	3	1	18	4	0.06	18	13	0.11	2	0.5	279

Pullman planting date was 10/11/05. Pullman harvest date was 7/27/06.

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; + = susceptible, - = resistant.

Aphanomyces = Aphanomyces root rot; 1 = no symptoms, 2 = 20% of lower leaves symptomatic, 3 = 50% of leave symptomatic and plant stunted, 4 = 80% of leaves symptomatic and plant stunted, 5 = all plants dead.

Pod height was measured at the green pod stage and at harvest maturity. Pod height index was determined by dividing pod height at harvest maturity by the green pod height.

Plant height was measured at the green plant stage and at harvest maturity. Plant height index was determined by dividing plant height at harvest maturity by the green plant height.

Rep Nodes = average number of reproducing nodes on a plant.

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

Table 15. Agronomic Data for the Advanced Winter Clear Seed Coat Dry Pea Yield Trial, 2006 (0622)

Cultivar	Origin	Leaf Type	Plant Type	FW	PM	Aphano-myces	Nodes to First Flower	Mean Pods/ Peduncle	Mean Pod Ht (green)	Mean Pod Ht (mature)	Mean Pod Ht Index	Mean Plant Ht (green)	Mean Plant Ht (mature)	Mean Plant Ht Index	Mean Rep Nodes	Mean Weight 100 Seed	Mean Seed Yield
									..cm..	..cm..		..cm..	..cm..			..g..	kg/ha
PS03100635	X92P056	-	+	+	+	3.3	16.0	2.0	63	7	0.12	139	38	0.28	7.7	12.0	3370
PS0230F210	X97P088	+	+	+	+	3.3	15.5	2.0	81	6	0.07	151	22	0.15	5.7	17.9	3365
PS03101133	X97P098	+	+	+	+	3.2	19.7	2.0	98	12	0.13	156	32	0.20	7.5	13.2	3228
PS03100660	X95P679	+	+	-	+	3.2	17.3	2.0	59	8	0.13	130	26	0.21	6.8	11.8	3158
SPECTER	X92P056	-	+	+	+	3.3	19.7	2.0	83	8	0.09	153	23	0.15	7.3	13.0	2979
WINDHAM	X93P060	-	-	+	+	3.5	16.8	2.0	43	15	0.35	73	42	0.59	5.5	14.6	2837
PS03101150	X98P099	-	-	+	+	2.7	17.7	2.0	52	8	0.15	98	37	0.38	7.3	15.4	2824
PS03101146	X98P099	-	-	+	+	2.8	17.0	2.0	47	6	0.12	81	32	0.39	5.7	14.7	2765
PS0230F063	X98P098	-	-	+	+	2.8	18.7	2.0	49	10	0.21	80	35	0.45	6.8	12.9	2704
PS03101160	X98P100	-	-	+	+	3.5	18.3	2.0	49	6	0.13	79	32	0.40	4.7	14.7	2696
PS0230F092	X98P100	-	-	+	+	3.0	18.3	2.0	39	10	0.32	66	39	0.58	4.8	13.7	2695
WHISTLER	WPX90105-9	-	-	+	+	3.3	17.3	2.0	43	7	0.18	81	40	0.51	5.3	17.2	2662
PS9830F011	X92P056	-	-	+	+	3.7	17.3	2.0	37	14	0.41	66	54	0.82	6.8	14.5	2566
PS0230F061	X98P097	-	-	+	+	2.5	19.2	2.0	42	11	0.37	81	45	0.57	6.7	15.7	2434
WPX91205	…	…	…	…	…	3.5	15.2	1.0	42	8	0.22	75	48	0.67	6.8	17.7	1414
DP8853-6	…	…	…	…	…	3.8	17.2	1.0	33	7	0.22	76	39	0.52	7.5	15.6	1401
Grand Mean						3.2	17.6	1.8	54	9	0.20	99	36	0.43	6.4	14.7	2694
C.V. (%)						11.9	10.3	21	20	47	68	12	16	22	23.7	3.0	16
LSD $_{(\alpha=0.05)}$						0.5	3.0	0.5	15	6	0.19	17	8	0.13	2.5	0.6	595

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; + = susceptible, - = resistant.

Aphanomyces = Aphanomyces root rot; 1 = no symptoms, 2 = 20% of lower leaves symptomatic, 3 = 50% of leave symptomatic and plant stunted, 4 = 80% of leaves symptomatic and plant stunted, 5 = all plants dead.

Pod height was measured at the green pod stage and at harvest maturity. Pod height index was determined by dividing pod height at harvest maturity by the green pod height.

Plant height was measured at the green plant stage and at harvest maturity. Plant height index was determined by dividing plant height at harvest maturity by the green plant height.

Rep Nodes = average number of reproducing nodes on a plant.

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

Table 16. Agronomic and Yield Data for the Winter Dry Pea Observation Nursery, 2006 (0625)

Cultivar	Origin	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..
PS05300126	...	18	2.0	89	6	0.06	167	23	0.14	5.5	18.5	3790
PS05300108	...	18	2.0	31	7	0.21	92	24	0.26	9.5	14.7	3530
PS05300213	...	19	2.0	101	5	0.04	168	20	0.12	5.5	15.1	3483
PS05300008	...	18	2.0	88	6	0.06	163	22	0.14	7.0	13.9	3330
PS05300083	...	17	2.0	55	11	0.19	78	30	0.38	3.0	23.0	3326
CAH-61	...	18	2.0	57	10	0.18	86	38	0.44	5.0	16.3	3316
PS05300095	...	18	2.0	90	4	0.04	154	15	0.10	5.0	13.8	3301
PS05300228	X00P135	17	1.0	39	5	0.12	73	42	0.58	6.0	15.5	3221
PS05300092	...	18	2.0	104	6	0.05	185	18	0.09	7.5	14.4	3098
PS05300078	...	15	2.0	33	4	0.12	65	34	0.52	6.0	22.4	2959
PS05300180	...	16	2.0	34	3	0.09	88	40	0.45	7.5	14.8	2908
PIVER	...	24	2.0	105	6	0.06	156	21	0.13	4.5	10.2	2906
PS05300220	X00P092	15	2.0	50	3	0.05	88	37	0.41	6.0	15.2	2890
PS05300004	...	17	1.0	101	6	0.05	145	21	0.14	4.5	13.5	2883
PS05300222	X00P135	20	1.0	41	3	0.06	71	36	0.51	6.5	15.6	2858
CAH-11	...	22	2.0	74	9	0.12	111	27	0.24	6.0	11.6	2831
PS05300176	...	16	1.0	30	5	0.17	70	36	0.52	6.5	14.9	2680
PS05300094	...	15	2.0	54	7	0.12	117	27	0.23	6.5	14.8	2661
PS05300075	...	15	1.0	39	3	0.06	57	33	0.58	3.5	22.7	2659
D12-4-3SL	...	16	2.0	37	6	0.15	88	44	0.49	8.0	13.8	2646
PS05300101	...	18	1.0	62	7	0.10	94	18	0.19	5.0	13.8	2644
PS05300132	...	20	1.0	124	4	0.03	171	20	0.11	4.5	14.1	2562
PS05300239	X00P137	13	1.0	17	7	0.38	65	47	0.72	7.5	18.0	2554
PS05300067	...	15	2.0	29	1	0.03	62	35	0.57	5.5	22.2	2530
PS05300069	...	17	1.0	36	4	0.11	65	30	0.47	5.5	24.4	2508
PS05300233	X00P137	16	1.0	28	3	0.09	56	28	0.50	5.0	15.6	2493
PS05300077	...	17	2.0	60	5	0.08	92	38	0.41	5.0	21.9	2446
PS05300205	...	14	2.0	30	8	0.27	79	33	0.42	8.0	14.7	2377
PS05300141	...	21	2.0	83	8	0.09	159	20	0.12	6.5	12.9	2345
PS05300234	X00P137	16	2.0	35	8	0.22	56	53	0.95	3.5	17.1	2303
PS05300195	...	19	2.0	27	6	0.22	74	32	0.43	10.0	16.5	2265
PS05300043	X98P085	15	2.0	35	4	0.12	77	52	0.68	7.5	18.1	2219
S-35	...	18	2.0	111	12	0.11	166	24	0.14	4.5	11.5	2218
PS05300245	X00P137	18	2.0	38	3	0.08	69	38	0.55	5.0	17.1	2181
PS05300196	...	15	1.0	31	6	0.18	65	39	0.60	5.0	15.8	2117
AW-22	...	23	2.0	94	9	0.09	177	21	0.12	8.5	11.6	1920
PS05300225	X00P135	19	2.0	28	1	0.04	72	61	0.84	7.5	18.4	1798
AW-5	...	8	2.0	41	6	0.13	64	31	0.48	4.5	13.1	1603
PS05300178	...	17	2.0	34	13	0.37	59	39	0.65	3.0	16.9	1583
PS05300241	X00P137	20	2.0	34	10	0.30	58	53	0.92	3.5	16.9	1468
PS05300045	X98P085	14	1.0	27	4	0.15	56	43	0.77	7.5	18.5	1257

Table 16. Agronomic and Yield Data for the Winter Dry Pea Observation Nursery, 2006 (0625)

Cultivar	Origin	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..
PS05300054	…	17	1.0	25	1	0.04	48	38	0.79	6.5	21.0	1213
PS05300243	X00P137	14	1.0	22	5	0.23	64	50	0.77	7.5	16.9	1153
PS05300244	X00P137	17	1.0	25	4	0.14	53	47	0.89	5.5	17.1	1144
PS05300246	X00P137	14	1.0	18	2	0.11	43	44	1.02	5.0	16.4	825
PS05300232	X00P137	18	2.0	32	2	0.06	68	38	0.56	8.0	18.4	680
PS05300085	…	21	2.0	34	7	0.21	60	39	0.65	7.0	18.9	533
PS05300250	X00P197	17	1.0	23	4	0.15	50	25	0.50	5.5	17.8	487
PS05300252	X00P197	16	1.0	32	2	0.06	68	33	0.49	6.5	17.3	425
PS05300050	X98P086	20	1.0	23	6	0.27	52	43	0.82	8.0	20.4	413
PS05300248	X00P197	14	1.0	24	1	0.04	46	42	0.91	5.0	18.9	299
Grand Mean		17	1.6	49	5	0.13	90	34	0.48	6.0	16.6	2232
CV		16	30	59	53	67	46	31	54	26	19	41

Planting date was 10/11/05. Harvest date was 7/27/06.

Pod height was measured at the green pod stage and at harvest maturity. Pod height index was determined by dividing pod height at harvest maturity by the green pod height.

Plant height was measured at the green plant stage and at harvest maturity. Plant height index was determined by dividing plant height at harvest maturity by the green plant height.

Rep Nodes = average number of reproducing nodes on a plant.

Agronomic and yield data are one replication at Pullman, WA

Field Evaluation of Pea Cultivars for Resistance to White Mold and Powdery Mildew

Twenty-four pea varieties (12 green pea and 12 yellow pea) were evaluated for resistance to white mold and powdery mildew in Corvallis, Oregon. Thanks to Dr. Jim Myers of Oregon State University. Each cultivar was replicated four times. The plots were planted July 24, 2006, and disease incidences were evaluated on November 29 for white mold infection (*Sclerotinia sclerotiorum)* and also for powdery mildew infection (*Erysiphe* sp.). White mold was evaluated as percent of infected plants, and presented as means of the four replications. Powdery mildew was evaluated as presence (+) or absence (-). Each + indicate presence of powdery mildew in one replication. Thus four plus signs (++++) indicate presence of powdery mildew in all four plots.

Table 17. Field Evaluation of Pea Cultivars for Tolerance to white mold and powdery mildew at Corvallis, Oregon, 2006 (0696PG and 0696PY)

Green Pea			*Yellow Pea*		
Cultivar	Percent of White Mold	Powdery Mildew Score	Cultivar	Percent of White Mold	Powdery Mildew Score
CAMRY	75	+ + + +	MIDAS	78	+ + + +
PACIFICA	75	+ + + +	SUPRA	78	+ + + +
STRATUS	75	+ + + +	CAROUSEL	76	+ + + +
BLUEBIRD	74	+ + + +	FALLON	76	+ + + +
K-2	69	- - + +	REX	73	+ + + +
COOPER	66	+ + + +	DELTA	59	- - - -
ARIEL	63	- - + +	SWING	58	- - - -
MONARCH	60	+ + + +	TOPEKA	58	- - - -
LIFTER	56	- + - -	UNIVERSAL	48	- - - -
COLUMBIAN(LOT-I)	54	- - - -	EIFFEL	39	- - - +
STIRLING	54	- - - -	SHAWNEE	31	- - - -
CRUISER	48	- - - -	GUIDO	19	- - - -
Grand Mean	64			58	
C.V. (%)	13			18	
LSD $_{(\alpha=0.05)}$	10			12	

Planting date 07/24/06. Disease evaluation on 11/29/06.
White mold data are means of four replications
Presence (+) or absence (-) of powdery mildew in each plot is indicated.

Lentil Trial Results

Twenty-five entries and five check varieties ('Pennell', 'Merrit', 'Richlea', 'Mason' and 'Brewer') were included in the advanced large-seeded yellow lentil yield trial in 2006. The nursery was planted at Pullman and Farmington, WA, and at Genesee, ID; however, only Pullman and Genesee were harvested. Mean yields of the trials were not very good and a reflection of poor weather conditions during the summer. Mean yield for the nursery over two locations was 589 kg/ha. Four lines (LC01602300R, LC02600193R, LC03601668L and LC03601588R) were the highest yielding when averaged over the locations. Merrit exceeded the yield of Pennell by 405 kg/ha and Merrit was about equal in yield compared to the Brewer check. LC860616L has been in the trials for five years and was released in 2006 as 'Riveland'. Riveland was tall, early maturing and had larger seed size when compared to Pennell and Merrit. Standing ability was also very good.

Overall, the entries in the trial were selected for good plant height indices and good standing ability. Data collected on the 30 entries indicate that progress has been made in improving standing ability, seed size and yield. Future variety releases are expected to stand more erect, ensuring greater ease of harvest, seeds will be larger and yields should be improved.

Advanced yield trials of Turkish red types were also planted at the same three locations as mentioned above, with 13 entries and 'Crimson' included as the check variety. Turkish red selections, LC04600751T and LC03600126T were the highest yielding with line LC03600482T and LC01602062T just below Crimson. All four lines had good plant height and seed size. LC03600482T has performed well over the past two years; however, feedback from processors within the industry has indicated that other lines also have outstanding appeal to the international market. The check variety, Crimson, had a mean yield of 1025 kg/ha. The major objectives in selection of Turkish red types are increasing plant height, better standing ability and improved seed quality.

Ten Eston type selections were compared to 'Eston' and 'Athena' at the same three locations as mentioned above. One selection, LC01602273E, was significantly higher yielding when compared to the Eston check in 2003, 2004, 2005 and 2006. LC01602273E has been taller in previous years compared to Eston, but was similar to Estong in 2006 for both height and standing ability. This line is a candidate to be proposed for preliminary release.

Eleven Spanish brown type selections were compared to 'Pardina' in an advanced yield trial at the same three locations as mentioned above. One selection, LC04600346P was higher yielding than the Pardina check variety by 73 kg/ha. LC04600346P was slightly taller and had a mean plant height index of 0.93. That indicates good standing ability and was superior to Pardina. Additional testing is needed before it can be proposed for release.

POTENTIAL VARIETY RELEASES:

Riveland, selection LC860616L, has averaged 15, 4, 7 and 3%, higher yields over the past four years (2001-2004), respectively, when compared to the Brewer check. In 2005 and 2006 it had yields 8 and 9% less than Brewer, respectively. Riveland has

exceptionally large seeds and in 2004 the 100 seed weight was 7.9 grams compared to 6.1 for Brewer and 7.5 for Pennell. Seed size was reduced proportionally in 2005 and 2006. Standing ability was also good. Approximately 500 lbs of Breeder seed was produced in 2006 and will be increased to Foundation in 2007.

Pre-breeder seed for a yellow cotyledon zero tannin selection, LC7601114YZ and a red cotyledon zero tannin selection, LC00600917RZ, was developed in 2006 and these selections will be proposed for release at the 2007 WSU Legume Variety Release Committee meeting.

Table 18. Location Yield Summary (kg/ha) for the Advanced Large Yellow Lentil Yield Trial, 2006 (0652)

Cultivar	Origin	Genesee	Pullman	Mean Seed Yield
LC03601588R	X98L041	939	897	918
LC01602300R	X98L047	781	1017	899
LC03601668L	X01L015	738	918	828
LC02600193R	X98L014	674	951	812
MASON	…	684	915	799
MERRIT*	…	578	1018	798
BREWER	…	659	912	786
LC03601115L	X00L001	777	679	728
Riveland	X95L073	693	752	723
LC02600793L	X95L240	718	707	713
LC03600854L	X97L001	662	674	668
RICHLEA	…	562	669	616
LC03600729L	X96L090	680	548	614
LC03600632L	X95L250	468	684	576
LC99602075L	X96L092	570	554	562
LC99600747L	X95L078	480	621	551
LC02601124R	X98L039	639	440	540
LC03600511L	X95L093	634	434	534
LC03600962L	X97L029	456	605	531
LC02601118R	X98L039	559	468	513
LC03600606L	X95L248	480	521	501
LC01601394L	X96L110	439	466	453
LC03600914L	X97L018	513	360	437
LC860359L	X93L035	631	220	425
PENNELL	…	426	361	393
LC03601104L	X00L002	556	170	363
LC99600345L	X93L027	310	408	359
LC01600724L	X98L010	321	376	348
LC03601067L	X97L050	289	393	341
LC03601029L	X97L042	349	320	335
Grand Mean		575	602	589
C.V. (%)		17	17	17
LSD $_{(\alpha=0.05)}$		130	136	112
Planting Date		4/26/06	4/28/06	
Harvest Date		8/23/06	8/14/06	

Yield data are means of three replications at each location, over two locations.
*Check variety

Table 19. Agronomic Data for the Advanced Large Yellow Lentil Yield Trial, 2006 (0652)

Cultivar	Origin	Disease Aph	Days to Flower	Days to Maturity	Pods/ Peduncle	Pod Ht (green)	Pod Ht (mature)	Pod Ht index	Plant Ht (green)	Plant Ht (mature)	Plant Ht index	Weight 100 Seed
						..cm..	..cm..		..cm..	..cm..		..g..
LC03601588R	X98L041	4.0	61	90	2	15	9	0.61	36	33	0.92	4.3
LC01602300R	X98L047	4.7	59	93	2	18	11	0.64	36	39	1.06	4.9
LC03601668L	X01L015	4.2	54	89	2	18	9	0.48	36	30	0.84	6.6
LC02600193R	X98L014	4.3	59	90	2	15	10	0.65	31	29	0.94	5.0
MASON	...	4.2	54	89	2	17	8	0.52	31	29	0.96	6.8
MERRIT*	...	4.0	53	88	2	13	9	0.81	33	31	0.93	6.6
BREWER	...	4.2	53	88	2	19	6	0.34	34	26	0.76	6.0
LC03601115L	X00L001	...	57	90	2	15	8	0.55	29	28	0.95	6.9
Riveland	X95L073	3.8	59	89	2	18	7	0.40	39	31	0.79	7.0
LC02600793L	X95L240	4.3	57	89	2	19	11	0.59	35	27	0.79	7.3
LC03600854L	X97L001	4.2	57	89	2	19	11	0.59	37	32	0.85	7.0
RICHLEA	...	4.3	60	90	2	21	11	0.53	37	34	0.93	5.4
LC03600729L	X96L090	4.2	56	92	2	19	13	0.70	36	34	0.96	7.5
LC03600632L	X95L250	4.3	53	89	2	17	7	0.38	32	30	0.93	7.6
LC99602075L	X96L092	4.2	59	91	2	19	10	0.51	33	25	0.77	7.5
LC99600747L	X95L078	4.7	59	90	2	20	9	0.45	39	30	0.77	6.8
LC02601124R	X98L039	4.0	61	90	2	21	10	0.47	40	29	0.72	5.6
LC03600511L	X95L093	4.0	59	91	2	19	12	0.61	37	33	0.91	7.5
LC03600962L	X97L029	4.0	53	90	2	21	12	0.58	41	33	0.79	6.7
LC02601118R	X98L039	4.0	60	89	2	20	9	0.46	36	30	0.83	4.8
LC03600606L	X95L248	0.0	53	91	2	16	10	0.62	35	27	0.79	7.9
LC01601394L	X96L110	4.0	58	90	2	18	10	0.58	39	34	0.89	7.4
LC03600914L	X97L018	4.5	59	90	2	18	10	0.58	35	33	0.95	6.8
LC860359L	X93L035	4.8	61	91	2	22	13	0.59	38	34	0.91	6.5
PENNELL	...	4.5	60	90	2	20	10	0.48	33	33	1.00	6.6
LC03601104L	X00L002	4.2	60	90	2	20	11	0.53	34	31	0.90	6.4
LC99600345L	X93L027	4.3	58	90	2	22	12	0.55	41	32	0.79	6.5
LC01600724L	X98L010	4.2	60	89	2	20	6	0.32	35	24	0.69	6.1
LC03601067L	X97L050	3.8	58	91	2	20	11	0.57	34	30	0.87	7.0
LC03601029L	X97L042	4.0	58	63	2	19	12	0.61	34	33	0.99	7.1
Grand Mean		4.2	58	89	2	19	10	0.54	36	31	0.87	6.5
C.V. (%)		8.2	2	11	5	12	23	28.55	7	10	11.98	13.7
LSD $_{(\alpha=0.05)}$		0.5	1	14	0	3	3	0.21	3	4	0.14	0.0

Aph = Aphanomyces; 1 = no symptoms, 2 = some symptoms, 3 = moderate symptoms, 4 = severe symptoms, 5 = dead.
Pod height was measured at the green pod stage and at harvest maturity.
Pod height index was determined by dividing the value at harvest maturity by the green pod stage value.
Plant height was measured at the green pod stage and at harvest maturity.
Plant height index was determined by dividing the value at harvest maturity by the green pod stage value.
Agronomic data are means of three replications at the Pullman, WA location.
*Check Variety

Table 20. Mean Yields of the Advanced Large Yellow Lentil Yield Trial, 2002 - 2006

Cultivar	Origin	2002		2003		2004		2005		2006	
		kg/ha	% check	kg/ha	% check	kg/ha	% check	kg/ha	% check	kg/ha	% check
LC03601588R	X98L041	…	…	…	…	…	…	…	…	918	115
LC01602300R	X98L047	…	…	…	…	2360	101	824	133	899	113
LC03601668L	X01L015	…	…	…	…	…	…	…	…	828	104
LC02600193R	X98L014	…	…	…	…	…	…	663	107	812	102
MASON	…	1304	94	1164	100	2157	92	468	76	799	100
MERRIT*	…	1387	100	1166	100	2347	100	618	100	798	100
BREWER	…	1233	89	1170	100	2250	96	596	96	786	98
LC03601115L	X00L001	…	…	…	…	…	…	…	…	728	91
Riveland	X95L073	1282	92	1253	107	2325	99	550	89	723	91
LC02600793L	X95L240	…	…	…	…	…	…	597	97	713	89
LC03600854L	X97L001	…	…	…	…	…	…	…	…	668	84
RICHLEA	…	1459	105	1249	107	2395	102	651	105	616	77
LC03600729L	X96L090	…	…	…	…	…	…	…	…	614	77
LC03600632L	X95L250	…	…	…	…	…	…	…	…	576	72
LC99602075L	X96L092	1382	100	1210	104	2249	96	546	88	562	70
LC99600747L	X95L078	1245	90	1196	103	2469	105	717	116	551	69
LC02601124R	X98L039	…	…	…	…	…	…	522	84	540	68
LC03600511L	X95L093	…	…	…	…	…	…	…	…	534	67
LC03600962L	X97L029	…	…	…	…	…	…	…	…	531	66
LC02601118R	X98L039	…	…	…	…	…	…	563	91	513	64
LC03600606L	X95L248	…	…	…	…	…	…	…	…	501	63
LC01601394L	X96L110	…	…	…	…	2157	92	508	82	453	57
LC03600914L	X97L018	…	…	…	…	…	…	…	…	437	55
LC860359L	X93L035	1380	99	1239	106	2395	102	548	89	425	53
PENNELL	…	1364	98	1114	96	2262	96	607	98	393	49
LC03601104L	X00L002	…	…	…	…	…	…	…	…	363	46
LC99600345L	X93L027	1278	92	1184	102	2190	93	499	81	359	45
LC01600724L	X98L010	…	…	…	…	…	…	564	91	348	44
LC03601067L	X97L050	…	…	…	…	…	…	…	…	341	43
LC03601029L	X97L042	…	…	…	…	…	…	…	…	335	42
Grand Mean		1203		1087		2226		513		589	
LSD $_{(\alpha=0.05)}$		251		86		298		80		112	

Yield data are means of three replications at each location, over three locations in each year except 2006 which is the mean of two locations.
*Check variety

Table 21. Location Yield Summary (kg/ha) for the Advanced Turkish Red Type Lentil Yield Trial, 2006 (0651T)

Cultivar	Origin	Genesee	Pullman	Mean Seed Yield
LC04600751T	X00L020	1120	987	1053
LC03600126T	X97L085	896	1159	1027
CRIMSON*	…	921	1129	1025
LC03600482T	X97L116	989	1037	1013
LC01602062T	X96L057	857	1134	995
LC04600774T	X00L024	848	1020	934
LC01601724T	X95L032	764	1104	934
LC04600505T	X00L018	840	1014	927
LC04600762T	X00L020	984	855	919
LC04600775T	X00L024	859	952	905
LC02601276T	X97L108	650	999	825
LC04600754T	X00L020	656	946	801
LC01601751T	X95L049	388	927	658
LC03600257T	X97L084	356	900	628
Grand Mean		795	1012	903
C.V. (%)		15	8	12
LSD $_{(\alpha=0.05)}$		171	118	122
Planting Date		4/26/06	4/28/06	
Harvest Date		8/23/06	8/15/06	

Yield data are means of three replications at each location, over two locations.
*Check variety

Table 22. Agronomic Data for the Advanced Turkish Red Type Lentil Yield Trial, 2006 (0651T)

Cultivar	Origin	Disease Aph	Days to Flower	Days to Maturity	Pods/ Peduncle	Pod Ht (green)	Pod Ht (mature)	Pod Ht index	Plant Ht (green)	Plant Ht (mature)	Plant Ht index	Weight 100 Seed
						..cm..	..cm..		..cm..	..cm..		..g..
LC04600751T	X00L020	4.5	54	89	2	13	8	0.65	28	28	0.99	3.5
LC03600126T	X97L085	4.5	54	88	2	14	7	0.50	29	29	1.00	4.5
CRIMSON*	…	4.5	60	89	2	15	6	0.41	29	27	0.96	3.2
LC03600482T	X97L116	4.0	56	88	2	13	11	0.80	30	31	1.02	3.2
LC01602062T	X96L057	4.3	54	88	2	13	7	0.55	33	32	0.98	4.3
LC04600774T	X00L024	4.3	56	88	2	14	12	0.86	33	32	0.99	3.7
LC01601724T	X95L032	4.8	56	91	2	13	5	0.38	28	26	0.96	4.2
LC04600505T	X00L018	4.7	56	89	2	12	7	0.57	30	31	1.06	3.8
LC04600762T	X00L020	4.2	54	90	2	11	6	0.55	28	28	1.02	4.3
LC04600775T	X00L024	4.5	55	89	2	16	10	0.66	38	36	0.95	4.2
LC02601276T	X97L108	4.3	59	89	2	18	10	0.60	36	32	0.90	3.7
LC04600754T	X00L020	4.0	61	91	2	15	9	0.59	35	33	0.96	3.7
LC01601751T	X95L049	3.8	61	90	2	20	10	0.49	35	30	0.87	3.4
LC03600257T	X97L084	3.7	59	91	2	17	9	0.51	32	31	0.98	4.0
Grand Mean		4.3	57	89	2	15	8	0.58	32	31	0.98	3.8
C.V. (%)		7.7	1	1		15	23	28.14	8	8	9.41	10.6
LSD (α=0.05)		0.5	1	1		3	3	0.23	3	3	0.13	0.0

Aph = Aphanomyces; 1 = no symptoms, 2 = some symptoms, 3 = moderate symptoms, 4 = severe symptoms, 5 = dead.
Pod height was measured at the green pod stage and at harvest maturity.
Pod height index was determined by dividing the value at harvest maturity by the green pod stage value.
Plant height was measured at the green pod stage and at harvest maturity.
Plant height index was determined by dividing the value at harvest maturity by the green pod stage value.
Agronomic data are means of three replications at the Pullman, WA location.
*Check Variety

Table 23. Mean Yields of the Advanced Turkish Red Type Lentil Yield Trial, 2002 - 2006

Cultivar	Origin	2002		2003		2004		2005		2006	
		kg/ha	% check	kg/ha	% check	kg/ha	% check	kg/ha	% check	kg/ha	% check
LC04600751T	X00L020	…	…	…	…	…	…	…	…	1053	103
LC03600126T	X97L085	…	…	…	…	…	…	648	91	1027	100
CRIMSON*	…	1232	100	1324	100	1858	100	715	100	1025	100
LC03600482T	X97L116	…	…	…	…	…	…	792	111	1013	99
LC01602062T	X96L057	…	…	1518	115	2038	110	682	95	995	97
LC04600774T	X00L024	…	…	…	…	…	…	…	…	934	91
LC01601724T	X95L032	…	…	1214	92	1685	91	617	86	934	91
LC04600505T	X00L018	…	…	…	…	…	…	…	…	927	90
LC04600762T	X00L020	…	…	…	…	…	…	…	…	919	90
LC04600775T	X00L024	…	…	…	…	…	…	…	…	905	88
LC02601276T	X97L108	…	…	…	…	1698	91	866	121	825	80
LC04600754T	X00L020	…	…	…	…	…	…	…	…	801	78
LC01601751T	X95L049	…	…	…	…	…	…	…	…	658	64
LC03600257T	X97L084	…	…	…	…	…	…	537	75	628	61
Grand Mean		1212		1272		1786		494		903	
LSD (α=0.05)		71		89		335		88		122	

Yield data are means of three replications at each location, over three locations in each year except 2006 which is the mean of two locations.
*Check variety

Table 24. Location Yield Summary (kg/ha) for the Advanced Eston Type Lentil Yield Trial over Locations, 2006 (0651E)

Cultivar	Origin	Genesee	Pullman	Mean Seed Yield
LC01602273E	X98L041	1413	884	1149
LC04600802E	X01L020	1125	961	1043
LC03601590E	X98L041	1130	879	1004
LC01602307E	X98L047	907	974	940
LC01602341E	X98L054	1057	553	805
ATHENA	…	831	543	687
LC04600383E	X00L011	909	451	680
ESTON*	…	824	454	639
LC02601130E	X98L039	559	436	497
LC04600595E	X01L007	446	358	402
LC01600736E	X98L011	307	338	322
LC04600588E	X01L007	187	218	203
Grand Mean		808	587	698
C.V. (%)		14	18	16
LSD $_{(\alpha=0.05)}$		161	146	127
Planting Date		4/26/06	4/28/06	
Harvest Date		8/23/06	8/14/06	

Yield data are means of three replications at each location, over two locations.
*Check variety

Table 25. Agronomic Data for the Advanced Eston Type Lentil Yield Trial, 2006 (0651E)

Cultivar	Origin	Disease Aph	Days to Flower	Days to Maturity	Pods/ Peduncle	Pod Ht (green)	Pod Ht (mature)	Pod Ht index	Plant Ht (green)	Plant Ht (mature)	Plant Ht index	Weight 100 Seed
						..cm..	..cm..		..cm..	..cm..		..g..
LC01602273E	X98L041	3.7	60	91	2	15	9	0.59	31	28	0.90	3.5
LC04600802E	X01L020	0.0	55	88	2	15	5	0.35	32	24	0.77	4.8
LC03601590E	X98L041	3.8	60	91	2	16	10	0.64	33	32	0.97	3.8
LC01602307E	X98L047	4.2	60	89	2	19	8	0.44	34	32	0.94	4.2
LC01602341E	X98L054	4.0	59	89	2	17	10	0.61	33	29	0.88	3.3
ATHENA	…	4.5	58	88	2	16	8	0.53	29	26	0.89	4.5
LC04600383E	X00L011	4.5	57	93	2	18	9	0.50	31	29	0.93	3.8
ESTON*	…	3.8	59	90	2	16	9	0.53	32	31	0.96	3.7
LC02601130E	X98L039	4.0	61	88	2	17	8	0.47	34	29	0.86	3.8
LC04600595E	X01L007	3.8	60	90	2	17	9	0.52	31	32	1.02	4.0
LC01600736E	X98L011	3.7	61	90	2	19	9	0.46	34	29	0.86	3.7
LC04600588E	X01L007	4.0	60	92	2	18	10	0.56	30	33	1.09	3.7
Grand Mean		4.0	59	90	2	17	9	0.52	32	29	0.92	3.9
C.V. (%)		11.4	1	1		11	23	23.88	6	10	9.73	10.3
LSD $_{(\alpha=0.05)}$		0.6	1	1		3	3	0.17	3	4	0.13	0.0

Aph = Aphanomyces; 1 = no symptoms, 2 = some symptoms, 3 = moderate symptoms, 4 = severe symptoms, 5 = dead.
Pod height was measured at the green pod stage and at harvest maturity.
Pod height index was determined by dividing the value at harvest maturity by the green pod stage value.
Plant height was measured at the green pod stage and at harvest maturity.
Plant height index was determined by dividing the value at harvest maturity by the green pod stage value.
Agronomic data are means of three replications at the Pullman, WA location.
*Check Variety

Table 26. Mean Yields of the Advanced Eston Type Lentil Yield Trial, 2002 - 2006

Cultivar	Origin	2002		2003		2004		2005		2006	
		kg/ha	% check	kg/ha	% check	kg/ha	% check	kg/ha	% check	kg/ha	% check
LC01602273E	X98L041	…	…	1220	120	1680	109	1022	268	1149	180
LC04600802E	X01L020	…	…	…	…	…	…	…	…	1043	163
LC03601590E	X98L041	…	…	…	…	…	…	1004	264	1004	157
LC01602307E	X98L047	…	…	1283	126	1890	123	983	258	940	147
LC01602341E	X98L054	…	…	1061	105	1523	99	843	221	805	126
ATHENA	…	923	97	1149	113	1733	113	430	113	687	108
LC04600383E	X00L011	…	…	…	…	…	…	…	…	680	106
ESTON*	…	955	100	1015	100	1539	100	381	100	639	100
LC02601130E	X98L039	…	…	…	…	1727	112	782	205	497	78
LC04600595E	X01L007	…	…	…	…	…	…	…	…	402	63
LC01600736E	X98L011	…	…	1234	122	1818	118	435	114	322	50
LC04600588E	X01L007	…	…	…	…	…	…	…	…	203	32
Grand Mean		861		1128		1638		608		698	
LSD $_{(\alpha=0.05)}$		72		95		311		89		127	

Yield data are means of three replications at each location, over three locations in each year except 2006 which is the mean of two locations.
*Check variety

Table 27. Location Yield Summary (kg/ha) for the Advanced Pardina Type Lentil Yield Trial, 2006 (0651P)

Cultivar	Origin	Genesee	Pullman	Mean Seed Yield
LC04600346P	X00L015	995	1290	1142
LC04600352P	X00L015	1001	1244	1122
LC04600350P	X00L015	1043	1101	1072
PARDINA*	…	1025	1112	1069
LC04600816P	X01L022	1008	1087	1048
LC03601127P	X93L010	890	1010	950
LC03600204P	X98L022	877	1004	940
LC04600341P	X00L015	707	1129	918
LC02601144P	X98L044	865	933	899
LC03601629P	X98L062	940	624	782
LC03601426P	X95L069	489	1045	767
LC04600810P	X01L020	930	222	576
Grand Mean		897	983	940
C.V. (%)		24	12	18
LSD $_{(\alpha=0.05)}$		298	164	199
Planting Date		4/26/06	4/28/06	
Harvest Date		8/23/06	8/15/06	

Yield data are means of three replications at each location, over two locations.
*Check variety

Table 28. Agronomic Data for the Advanced Pardina Type Lentil Yield Trial, 2006 (0651P)

Cultivar	Origin	Disease Aph	Days to Flower	Days to Maturity	Pods/ Peduncle	Pod Ht (green)	Pod Ht (mature)	Pod Ht index	Plant Ht (green)	Plant Ht (mature)	Plant Ht index	Weight 100 Seed
						..cm..	..cm..		..cm..	..cm..		..g..
LC04600346P	X00L015	4.2	53	88	2	10	5	0.48	25	24	0.93	4.2
LC04600352P	X00L015	4.0	53	88	2	11	7	0.60	26	24	0.92	4.4
LC04600350P	X00L015	4.5	55	89	2	10	6	0.54	28	24	0.84	4.2
PARDINA*	…	3.8	55	88	2	11	4	0.33	27	20	0.77	3.7
LC04600816P	X01L022	4.2	53	88	2	10	3	0.26	28	22	0.79	4.1
LC03601127P	X93L010	4.5	55	88	2	13	5	0.36	30	26	0.84	4.0
LC03600204P	X98L022	4.7	54	88	2	12	6	0.51	28	25	0.88	3.8
LC04600341P	X00L015	4.2	53	89	2	11	3	0.26	28	23	0.85	4.2
LC02601144P	X98L044	4.0	56	90	2	11	4	0.33	32	28	0.88	3.8
LC03601629P	X98L062	4.2	59	89	2	11	5	0.42	27	25	0.91	3.9
LC03601426P	X95L069	4.3	53	88	2	8	5	0.67	24	25	1.04	4.2
LC04600810P	X01L020	0.0	63	94	2	17	5	0.29	33	24	0.74	5.7
Grand Mean		4.2	55	89	2	11	5	0.42	28	24	0.87	4.2
C.V. (%)		6.4	1	1		11	41	33.77	8	13	13.51	11.9
LSD $_{(\alpha=0.05)}$		0.4	1	1		2	3	0.20	3	4	0.16	…

Aph = Aphanomyces; 1 = no symptoms, 2 = some symptoms, 3 = moderate symptoms, 4 = severe symptoms, 5 = dead.
Pod height was measured at the green pod stage and at harvest maturity.
Pod height index was determined by dividing the value at harvest maturity by the green pod stage value.
Plant height was measured at the green pod stage and at harvest maturity.
Plant height index was determined by dividing the value at harvest maturity by the green pod stage value.
Agronomic data are means of three replications at the Pullman, WA location.
*Check Variety

Table 29. Mean Yields of the Advanced Pardina Type Lentil Yield Trial, 2002 - 2006

Cultivar	Origin	2002		2003		2004		2005		2006	
		kg/ha	% check	kg/ha	% check	kg/ha	% check	kg/ha	% check	kg/ha	% check
LC04600346P	X00L015	…	…	…	…	…	…	…	…	1142	107
LC04600352P	X00L015	…	…	…	…	…	…	…	…	1122	105
LC04600350P	X00L015	…	…	…	…	…	…	…	…	1072	100
PARDINA*	…	1409	100	1334	100	2230	100	1037	100	1069	100
LC04600816P	X01L022	…	…	…	…	…	…	…	…	1048	98
LC03601127P	X93L010	…	…	…	…	…	…	1024	99	950	89
LC03600204P	X98L022	…	…	…	…	…	…	927	89	940	88
LC04600341P	X00L015	…	…	…	…	…	…	…	…	918	86
LC02601144P	X98L044	…	…	…	…	2090	94	1180	114	899	84
LC03601629P	X98L062	…	…	…	…	…	…	846	82	782	73
Grand Mean		1203		1305		2084		833		940	
LSD $_{(\alpha=0.05)}$		131		131		262		87		199	

Yield data are means of three replications at each location, over three locations in each year except 2006 which is the mean of two locations.
*Check variety

Table 30. Agronomic and Yield Data for the Preliminary Large Yellow Lentil Yield Trial, 2006 (0654)

Cultivar	Origin	Days to Flower	Days to Maturity	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..
						Laird Type						
LC04600633L	X01L010	55	91	2	18	13	0.70	37	35	0.94	8.0	1171
MASON	…	55	88	2	16	8	0.51	33	30	0.91	6.8	1152
LC04600705L	X01L015	56	89	2	17	10	0.58	37	34	0.92	6.2	1113
LC04600686L	X01L014	59	89	2	19	4	0.22	38	22	0.59	7.2	1075
LC04600010L	X97L001	53	91	2	14	9	0.60	33	32	0.96	8.0	1060
LC04600640L	X01L010	57	88	2	16	7	0.47	31	28	0.91	6.8	1052
LC04600799L	X01L019	56	90	2	19	13	0.68	35	32	0.91	7.5	1028
LC04600741L	X01L018	59	90	2	18	12	0.65	36	34	0.95	6.7	1000
LC04600552L	X01L004	59	91	2	18	11	0.62	34	34	1.01	7.3	988
LC04600270L	X97L051	57	89	2	20	6	0.29	36	27	0.74	6.6	962
LC04600650L	X01L012	60	92	2	20	8	0.42	40	33	0.83	7.0	949
LC04600643L	X01L010	55	88	2	16	7	0.45	32	26	0.83	6.9	919
LC04600512L	X01L001	56	90	2	18	8	0.45	35	29	0.84	7.8	915
LC04600784L	X01L019	59	90	2	19	14	0.75	35	36	1.06	7.6	906
LC04600698L	X01L014	59	92	2	19	11	0.58	39	33	0.86	7.2	898
LC04600170L	X97L038	59	91	2	19	11	0.55	37	26	0.70	7.5	888
LC04600128L	X97L028	59	93	2	18	13	0.73	34	32	0.93	7.4	884
LC04600780L	X01L018	56	91	2	19	10	0.57	35	34	0.97	6.7	884
LC04600628L	X01L009	53	88	2	15	11	0.73	32	29	0.93	6.9	882
LC04600537L	X01L003	59	91	2	18	13	0.74	39	34	0.87	8.2	881
LC04600017L	X97L002	59	91	2	18	6	0.34	37	31	0.84	7.9	879
PENNELL	…	60	91	2	20	13	0.68	33	34	1.03	6.4	871
LC04600736L	X01L018	59	92	2	17	12	0.71	33	37	1.11	7.7	864
LC04600246L	X97L048	61	90	2	17	10	0.58	33	31	0.94	6.5	863
LC04600689L	X01L014	59	91	2	20	9	0.44	37	33	0.88	7.0	854
LC04600688L	X01L014	59	89	2	23	4	0.24	37	22	0.60	6.8	845
LC04600029L	X97L003	61	90	2	18	7	0.39	36	26	0.72	6.5	842
LC04600156L	X97L036	59	93	2	18	12	0.68	37	33	0.87	7.8	836
LC04600696L	X01L014	59	90	2	18	11	0.62	38	33	0.87	6.8	823
LC04600103L	X97L024	60	92	2	19	7	0.39	35	31	0.90	7.4	820
LC04600062L	X97L009	60	90	2	21	13	0.64	38	35	0.90	6.6	798
LC04600306L	X97L049	59	90	2	20	13	0.68	39	35	0.89	6.4	793
LC04600697L	X01L014	59	91	2	18	12	0.69	39	34	0.88	7.7	776
LC04600023L	X97L002	60	94	2	19	11	0.60	37	33	0.89	7.4	745
LC04600064L	X97L009	55	90	2	15	11	0.78	33	31	0.93	6.6	737
LC04600550L	X01L004	59	91	2	19	12	0.68	37	36	0.99	6.8	727
LC04600232L	X97L047	55	91	2	18	9	0.51	34	33	0.96	7.4	724
LC04600565L	X01L005	57	91	2	18	11	0.65	32	32	0.99	8.1	713
LC04600213L	X97L042	54	91	2	18	12	0.67	36	35	0.97	7.0	670
LC04600051L	X97L008	60	91	2	14	10	0.71	31	32	1.01	5.9	646
LC04600068L	X97L009	59	92	2	17	11	0.66	31	28	0.90	6.9	643
LC04600562L	X01L005	56	92	2	16	13	0.80	33	29	0.89	8.3	640
LC04600049L	X97L008	60	92	2	20	7	0.36	39	32	0.83	7.5	603
LC04600202L	X97L040	59	90	2	20	7	0.36	38	25	0.66	7.4	585
LC04600069L	X97L009	55	91	2	16	9	0.57	32	31	0.96	6.7	570
LC04600223L	X97L043	62	92	2	19	9	0.50	34	28	0.82	6.9	527
Sub Mean – Laird		*58*	*91*	*2*	*18*	*10*	*0.57*	*35*	*31*	*0.89*	*7.1*	*848*

Cultivar	Origin	Days to Flower	Days to Maturity	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..
						Brewer Type						
MERRIT	…	54	88	2	15	10	0.68	32	29	0.90	6.2	1171
BREWER	…	53	88	2	14	7	0.52	34	27	0.79	5.7	1011
Sub Mean - Brewer		*54*	*88*	*2*	*15*	*9*	*0.60*	*33*	*28*	*0.85*	*6.0*	*1091*
						Richlea Type						
LC04600327R	X00L008	56	90	2	16	13	0.82	36	35	0.97	5.9	1230
RICHLEA	…	60	90	2	16	10	0.64	37	35	0.96	5.0	1178
LC04600734R	X01L017	56	88	2	19	11	0.62	37	33	0.90	6.4	1046
LC04600316R	X00L007	59	88	2	16	10	0.64	35	33	0.95	5.2	929
LC04600630R	X01L009	62	91	2	17	9	0.54	33	33	1.00	5.2	695
LC04600597R	X01L007	61	90	2	17	13	0.76	31	31	1.03	4.5	432
Sub Mean - Richlea		*59*	*90*	*2*	*17*	*11*	*0.67*	*35*	*33*	*0.97*	*5.4*	*918*
Grand Mean		58	90	2	18	10	0.58	35	31	0.90	6.9	865
C.V. (%)		1	1	4	12	26	28.42	6	13	13.33	11.8	10
LSD $_{(\alpha=0.05)}$		1	2	0	3	4	0.22	3	5	0.16	…	122

Planting date 4/28/06. Harvest date 8/16/06.
Pod height was measured at the green pod stage and at harvest maturity.
Pod height index was determined by dividing pod height at harvest maturity by the green pod height.
Plant height was measured at the green plant stage and at harvest maturity.
Plant height index was determined by dividing plant height at harvest maturity by the green plant height.
Agronomic and yield data are means of three replications at Pullman, WA.

Table 31. Location Yield Summary (kg/ha) for the Zero Tannin Lentil Yield Trial, 2006 (0661)

Cultivar	Origin	Genesee	Pullman	Mean Seed Yield
		Yellow Cotyledons		
LC7601114YZ	X93L001	557	1055	806
LC04600415YZ	X00L030	397	1054	725
LC04600476YZ	X00L038	590	833	712
LC04600421YZ	X00L031	428	913	671
LC04600402YZ	X00L028	358	946	652
LC04600439YZ	X00L032	334	934	634
LC04600387YZ	X00L027	282	912	597
LC04600389YZ	X00L027	256	904	580
LC02601251YZ	X00L031	339	762	550
LC04600440YZ	X00L032	296	754	525
LC04600454YZ	X00L033	306	714	510
LC03601309YZ	X00L038	248	741	494
Sub Mean – Yellow Cotyledons		366	877	*621*
		Red Cotyledons		
LC00600917RZ	X95L005	413	818	615
LC99602585RZ	X95L004	436	658	547
Sub Mean – Red Cotyledons		*425*	*738*	581
Grand Mean		328	870	599
C.V. (%)		315	865	590
LSD $_{(\alpha=0.05)}$		310	855	582
Planting Date		4/26/06	4/28/06	
Harvest Date		8/23/06	8/15/06	

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

Table 32. Agronomic and Yield Data for the Zero Tannin Lentil Yield Trial, 2006 (0661)

Cultivar	Origin	Days to Flower	Days to Maturity	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..
						Yellow Cotyledon						
LC7601114YZ	X93L001	55	92	2	15	12	0.79	33	36	1.09	5.3	1055
LC04600415YZ	X00L030	56	93	2	16	10	0.61	34	36	1.07	6.1	1054
LC04600476YZ	X00L038	57	90	2	16	10	0.66	33	32	0.95	5.6	833
LC04600421YZ	X00L031	56	93	2	18	12	0.67	35	33	0.93	5.8	913
LC04600402YZ	X00L028	57	91	2	16	10	0.64	35	35	1.01	5.5	946
LC04600439YZ	X00L032	58	93	2	18	10	0.55	35	32	0.91	6.1	934
LC04600387YZ	X00L027	58	91	2	18	11	0.60	35	32	0.91	5.6	912
LC04600389YZ	X00L027	58	61	2	18	12	0.66	35	35	1.01	5.7	904
LC02601251YZ	X00L031	59	90	2	18	7	0.41	34	30	0.87	5.5	762
LC04600440YZ	X00L032	59	92	2	14	10	0.74	31	34	1.10	6.1	754
LC04600454YZ	X00L033	58	91	2	17	5	0.30	33	27	0.80	5.8	714
LC03601309YZ	X00L038	59	92	2	16	8	0.51	32	31	0.97	4.9	741
Sub Mean – Yellow Cots		*58*	*89*	*2*	*17*	*10*	*0.60*	*34*	*33*	*0.97*	*5.7*	*877*
						Red Cotyledon						
LC00600917RZ	X95L005	57	89	2	11	7	0.59	26	25	0.96	3.9	658
LC99602585RZ	X95L004	54	89	2	13	8	0.63	30	31	1.06	4.2	818
Sub Mean – Red Cots		*56*	*89*	*2*	*12*	*8*	*0.61*	*28*	*28*	*1.01*	*4.1*	*738*
Grand Mean		57	89	2	16	9	0.60	33	32	0.98	5.4	857
C.V. (%)		2	16		10	25	27.01	6	9	10.52	12.0	13
LSD $_{(\alpha=0.05)}$		2	20		2	3	0.22	3	4	0.14	0.0	155

Planting date 4/28/06. Harvest date 8/15/06.
Pod height was measured at the green pod stage and at harvest maturity.
Pod height index was determined by dividing pod height at harvest maturity by the green pod height.
Plant height was measured at the green plant stage and at harvest maturity.
Plant height index was determined by dividing plant height at harvest maturity by the green plant height.
Agronomic and yield data are means of three replications at Pullman, WA.

Table 33. Agronomic and Yield Data for the Preliminary Lentil Screening Nursery, 2006 (0655)

Cultivar	Origin	Days to Flower	Days to Maturity	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..
						Laird Type						
LC05600973L	X00L008	56	87	2	18	15	0.83	35	35	1.00	6.0	862
LC05600977L	X00L008	56	85	2	15	9	0.60	27	29	1.07	5.9	747
LC05600966L	X00L007	59	87	2	19	10	0.53	42	34	0.81	4.9	550
LC05601268L	X01L017	56	86	2	17	10	0.59	30	34	1.13	7.9	434
LC05600973L	X00L008	56	87	2	18	15	0.83	35	35	1.00	6.0	862
LC05600977L	X00L008	56	85	2	15	9	0.60	27	29	1.07	5.9	747
Sub Mean - Laird		*57*	*86*	*2*	*17*	*11*	*0.64*	*34*	*33*	*1.00*	*6.2*	*648*
						Richlea Type						
LC05601303R	X01L020	56	84	2	16	8	0.50	34	25	0.74	5.0	1096
Sub Mean - Richlea		*56*	*84*	*2*	*16*	*8*	*0.50*	*34*	*25*	*0.74*	*5.0*	*1096*
						Pardina Type						
LC05601007P	X00L015	56	85	2	16	10	0.63	31	28	0.90	4.5	1338
LC05601016P	X00L016	56	85	2	13	7	0.54	27	26	0.96	3.7	1272
LC05600995P	X00L015	56	84	2	13	10	0.77	30	24	0.80	4.8	1268
LC05600820P	X98L050	56	85	2	19	6	0.32	29	24	0.83	4.5	1158
LC05600817P	X98L050	56	85	2	18	7	0.39	32	26	0.81	5.1	1133
LC05600823P	X98L050	56	84	2	16	9	0.56	33	26	0.79	5.5	1121
LC05601005P	X00L015	56	85	2	15	11	0.73	29	28	0.97	4.4	1098
LC05601017P	X00L016	56	84	2	14	4	0.29	30	21	0.70	3.8	1069
LC05600992P	X00L014	52	85	2	11	5	0.45	34	24	0.71	4.3	982
LC05600819P	X98L050	56	85	2	18	13	0.72	32	29	0.91	4.5	976
LC05601012P	X00L015	56	85	2	11	11	1.00	25	28	1.12	4.6	945
LC05600990P	X00L014	52	85	2	15	7	0.47	32	29	0.91	4.3	939
LC05601149P	X00L011	56	85	2	15	13	0.87	32	33	1.03	4.3	730
Sub Mean - Pardina		*55*	*85*	*2*	*15*	*9*	*0.60*	*30*	*27*	*0.88*	*3.5*	*1079*
						Eston Type						
LC05600812E	X98L049	52	86	2	15	13	0.87	33	28	0.85	4.1	1141
LC05601144E	X00L010	52	84	2	12	7	0.58	33	21	0.64	4.1	1121
LC05600810E	X98L049	56	85	2	14	15	1.07	31	30	0.97	5.2	1011
Sub Mean - Eston		*53*	*85*	*2*	*14*	*12*	*0.84*	*32*	*26*	*0.82*	*4.5*	*1091*
						Zero Tannin Type – Yellow Cot						
LC05601101YZ	X00L033	56	85	2	14	6	0.43	32	31	0.97	5.4	575
LC05601124YZ	X00L035	56	92	2	19	11	0.58	33	33	1.00	6.3	556
LC05601061YZ	X00L028	56	87	2	12	8	0.67	27	25	0.93	5.1	449
LC05601067YZ	X00L030	56	87	2	15	7	0.47	34	32	0.94	5.4	449
LC05601079YZ	X00L031	56	87	2	12	8	0.67	31	35	1.13	5.1	378
Sub Mean – Zero Tannin, Y		*56*	*88*	*2*	*14*	*8*	*0.56*	*31*	*31*	*0.99*	*5.5*	*481*

Cultivar	Origin	Days to Flower	Days to Maturity	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..
						Turkish Red Type						
LC05600043T	X97L085	56	84	2	19	4	0.21	33	24	0.73	4.7	1392
LC05600839T	X97L107	52	84	2	16	5	0.31	34	22	0.65	4.9	1332
LC05600791T	X98L044	52	85	2	16	6	0.38	33	25	0.76	5.0	1313
LC05600840T	X97L107	52	84	2	15	7	0.47	31	22	0.71	4.8	1214
LC05600806T	X98L047	56	87	2	18	18	1.00	36	40	1.11	5.9	1208
LC05600787T	X98L044	52	84	2	12	14	1.17	28	25	0.89	5.1	1173
LC05600771T	X98L043	52	84	2	12	6	0.50	29	22	0.76	4.6	1162
LC05600784T	X98L044	56	85	2	16	7	0.44	33	24	0.73	6.4	1160
LC05600777T	X98L043	52	85	2	15	9	0.60	28	27	0.96	4.5	1121
LC05600841T	X97L107	52	84	2	13	7	0.54	29	24	0.83	5.1	1098
LC05601022T	X00L018	52	85	2	14	14	1.00	35	38	1.09	4.5	1090
LC05600004T	X97L085	56	84	2	14	9	0.64	38	26	0.68	5.2	1046
LC05601023T	X00L018	56	87	2	14	11	0.79	37	36	0.97	4.6	1026
LC05600652T	X97L088	62	87	2	16	13	0.81	34	31	0.91	3.5	960
LC05600801T	X98L047	56	87	2	20	15	0.75	39	34	0.87	4.5	786
LC05600076T	X97L108	64	92	2	19	12	0.63	37	31	0.84	3.6	734
LC05600807T	X98L047	56	86	2	20	16	0.80	36	34	0.94	3.4	734
LC05600905T	X02ML074	52	85	2	13	7	0.54	30	27	0.90	4.5	703
LC05600568T	X97L100	59	85	2	20	13	0.65	38	31	0.82	3.7	643
LC05600883T	X02ML068	64	90	2	17	8	0.47	31	27	0.87	4.4	641
LC05600896T	X02ML071	52	84	2	14	3	0.21	27	20	0.74	4.6	596
LC05600878T	X02ML068	56	85	2	13	6	0.46	29	24	0.83	4.3	343
Sub Mean – Turkish Red		*55*	*86*	*2*	*16*	*10*	*0.61*	*33*	*28*	*0.85*	*4.6*	*976*
Grand Mean		55	86	2	15	9	0.62	32	28	0.88	4.9	895

Planting date 5/2/06. Harvest date 8/16/06.
Pod height was measured at the green pod stage and at harvest maturity.
Pod height index was determined by dividing pod height at harvest maturity by the green pod height.
Plant height was measured at the green plant stage and at harvest maturity.
Plant height index was determined by dividing plant height at harvest maturity by the green plant height.
Agronomic and yield data are one replication at Pullman, WA.

Table 34. Agronomic and Yield Data for Entries from Elsewhere in the World – Lentil Observation Nursery, 2006 (0607L)

Cultivar	Days to Flower	Days to Maturity	Pods/ Peduncle	Pod Ht (Green)	Pod Ht (Mature)	Pod Ht Index	Plant Ht (Green)	Plant Ht (Mature)	Plant Ht Index	Weight 100 Seed	Plot Seed Wt
				..cm..	..cm..		..cm..	..cm..		..g..	g/plot
1403T-43	56	56	3	14	9	0.64	36	35	0.97	2.7	100
98-035L*01H007	52	52	2	10	8	0.80	23	25	1.09	3.6	78
1385S-4	57	57	2	16	10	0.63	40	33	0.83	6.0	59
98-009L*01H046	52	52	2	11	5	0.45	26	24	0.92	4.1	47
ILL9916	52	52	2	12	9	0.75	29	24	0.83	4.3	44
98-019L*01H056	52	52	2	12	7	0.58	29	26	0.90	4.3	43
98-043L*01H008	56	56	2	10	6	0.60	25	22	0.88	4.5	31
1372S-10	59	59	2	13	9	0.69	31	27	0.87	3.2	31
98-009L*01H061	56	56	2	7	2	0.29	23	15	0.65	3.1	21
ILL9959	56	56	2	5	4	0.80	24	24	1.00	4.8	10
99-072L*01R002	56	56	2	6	6	1.00	23	22	0.96	4.4	7
Grand Mean	55	55	2	10	7	0.64	27	24	0.91	4.1	42

Planting date 5/2/06. Harvest date 8/16/06.
Pod height was measured at the green pod stage and at harvest maturity.
Pod height index was determined by dividing 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 plant height at harvest maturity by the green plant height.
Agronomic and yield data are one replication at Pullman, WA

Winter Lentil Trial Results

Twenty selections were included in the 2006 Winter Lentil Yield Trial. Similar to the peas, trials at Rosalia and Genesee were abandoned due to poor establishment and only trials at WSU Spillman Research Farm were harvested. Winter hardy lentil lines are targeted for direct seeding in standing wheat or barley stubble in order to aid in control of soil erosion and winter survival. It is also expected that seed yield will be increased up to or greater than 50% over traditional spring types. Average seed yield was 1817 kg/ha at Pullman. ‘Morton’, the recently released winter lentil, had an average yield of 2549 kg/ha and continues to serve as the standard check variety. Morton is relatively small-seeded and has red cotyledons and is expected to fit well into markets in South Asia. Selection for more robust and brick red cotyledon color and plump, rounded seed shape is a major objective of the winter lentil breeding program.

Ten Turkish red winter lentil selections were yield tested for the first time in a preliminary screening nursery at Pullman, WA and compared to and two checks. Entries with superior yield, agronomic performance and seed characters were advanced into the 2007 Advanced Winter Lentil Yield Trial.

Table 35. Agronomic Data for the Advanced Red Cotyledon Winter Lentil Yield Trial, 2006 (0641)

Cultivar	Origin	Mean Pods/ Peduncle	Mean Pod Ht (green)	Mean Pod Ht (mature)	Mean Pod Ht Index	Mean Plant Ht (green)	Mean Plant Ht (mature)	Mean Plant Ht Index	Weight 100 Seed	Mean Seed Yield
			..cm..	..cm..		..cm..	..cm..		..g..	kg/ha
LC9979065T	X92L043	3	20	16	0.80	49	35	0.73	2.8	2561
MORTON_*	X92L043	3	19	15	0.76	46	36	0.78	2.8	2549
LC03600232T	X97L104	3	23	15	0.66	61	38	0.62	3.2	2514
LC03600437T	X97L108	2	17	13	0.83	53	38	0.72	3.2	2290
LC9979062T	X92L043	2	20	15	0.74	46	42	0.93	2.9	2230
LC03600362T	X97L098	3	11	10	0.95	41	40	0.99	3.6	2171
LC03600292T	X98L012	3	14	12	0.87	41	36	0.91	3.3	2145
LC9978057T	X92L040	2	17	11	0.66	43	29	0.68	2.9	2045
LC02601276T	X97L108	3	21	12	0.58	50	41	0.84	3.1	1973
LC03600218T	X98L028	2	10	7	0.74	34	29	0.85	4.4	1727
LC03600190T	X97L096	2	9	7	0.76	39	32	0.84	3.5	1591
LC03600349T	X97L096	2	12	8	0.67	47	32	0.68	3.4	1583
LC03600245T	X97L108	3	22	13	0.62	50	33	0.69	2.7	1505
LC9440070r	X92L001	3	23	9	0.37	53	29	0.55	4.7	1450
LC03600295T	X98L012	2	14	11	0.75	42	37	0.87	4.0	1403
LC03600231T	X97L104	3	24	13	0.55	53	37	0.69	3.1	1364
LC02600449T	X97L084	2	12	9	0.73	37	32	0.89	3.9	1331
LC03600347T	X97L096	3	14	14	0.96	44	39	0.89	3.2	1322
WA8649041	…	3	29	16	0.59	55	33	0.59	2.6	1299
Grand Mean		2	17	12	0.72	46	35	0.78	3.3	1817
C.V. (%)		13	17	24	28	9	11	14	3	15
LSD $_{(\alpha=0.05)}$		0	4	4	0.27	6	5	0.15	0.2	376

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 in Pullman, WA .
Weight (g) of 100 seeds is the result of one sample lot from the Pullman, WA location.
*Check variety

Table 36. Agronomic Data for the Preliminary Red Cotyledon Winter Lentil Yield Trial, 2006 (0643)

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	Mean Seed Yield
			..cm..	..cm..		..cm..	..cm..		..g..	..kg/ha..
MORTON_*	X92L043	2.8	17	14	0.84	42	37	0.88	3.0	2398
LC04600754T	X00L020	2.0	9	8	0.88	48	28	0.60	3.7	1474
WA8649041	…	2.5	29	19	0.67	53	38	0.72	2.7	1310
LC03600230T	X97L104	1.5	18	12	0.66	35	37	1.06	3.3	1282
LC04600486T	X97L010	2.0	11	9	0.80	37	32	0.84	5.2	1192
LC04600775T	X00L024	2.5	9	5	0.53	39	29	0.74	3.6	852
LC04600762T	X00L020	2.0	7	5	0.83	33	29	0.87	3.8	665
LC04600751T	X00L020	2.0	7	4	0.56	31	29	0.94	3.7	655
LC04600505T	X00L018	2.0	8	7	0.79	33	33	1.00	4.0	479
LC04600763T	X00L024	1.8	6	4	0.71	30	24	0.85	3.8	401
LC04600766T	X00L024	1.8	7	4	0.61	32	27	0.87	3.5	344
LC04600755T	X00L020	2.0	5	3	0.85	33	26	0.79	3.9	245
Grand Mean		2	11	8	0.73	37	31	0.85	3.7	941
C.V. (%)		18.3	23	29	38.49	12	11	15.61	3.3	23
LSD $_{(\alpha=0.05)}$		0.5	4	3	0.39	6	5	0.19	0.2	301

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 and yield data are means of three replications at Pullman, WA.
*Check variety

Table 37. Agronomic Data for the Preliminary Red Cotyledon Winter Lentil Screening Nursery, 2006 (0645)

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	Mean Seed Yield
			..cm..	..cm..		..cm..	..cm..		..g..	..kg/ha..
LC05600512T	X97L096	3	11	10	0.86	60	22	0.37	3.7	3463
LC05600045T	X97L085	3	13	11	0.85	38	27	0.71	5.5	3200
LC05600004T	X97L085	3	13	9	0.65	41	30	0.73	4.8	2950
LC05600652T	X97L088	2	16	11	0.69	60	22	0.37	3.3	2859
MORTON_*	X92L043	3	13	7	0.51	48	25	0.52	4.6	2642
LC05600530T	X97L098	3	14	5	0.36	48	24	0.50	5.0	2819
LC05600532T	X97L098	3	11	6	0.55	53	23	0.43	5.4	2599
LC05600720T	X98L034	3	13	7	0.54	48	32	0.67	3.9	2586
LC05600685T	X98L017	3	15	9	0.57	43	21	0.49	4.2	2565
LC05600722T	X98L034	3	16	12	0.75	44	37	0.84	4.0	2453
LC05600006T	X97L085	3	14	6	0.43	42	34	0.81	4.5	2404
LC05600043T	X97L085	3	11	7	0.64	49	27	0.55	4.9	2300
LC05600627T	X97L108	2	42	10	0.23	60	27	0.45	3.6	2288
LC05600721T	X98L034	2	15	10	0.67	50	25	0.50	3.7	2285
LC05600568T	X97L100	2	18	10	0.53	51	33	0.65	3.6	2213
LC05600717T	X97L100	2	19	13	0.68	54	35	0.65	3.8	2127
LC05600076T	X97L108	2	34	10	0.28	57	29	0.51	3.2	1616
Grand Mean		2	17	9	0.58	50	28	0.57	4.2	2551

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 and yield data are the result from one replication at Pullman, WA.
*Check variety

Chickpea Trial Results

Sixteen selections and four check varieties were included in the advanced large kabuli chickpea yield trials conducted at Genesee, ID and Pullman, WA in 2006 (Table 38 and 39). Check varieties included recently released Dylan, Troy (CA9990I875W), as well as Sierra and Dwelley. Yield was about average of the previous four years (2002-2005), better than what was obtained in 2003 and 2006, but significantly lower than what was harvested in 2004 (Table 40). Among the check varieties, Sierra yielded highest, closely followed by Dylan and Troy. Five of the sixteen selections yielded better than the best check variety Sierra. The small seeded selection CA0090B347C had been the best yielding in the previous four years in the Palouse as well as in the Great Plains, although it yielded about the same as Dwelley last year (Table 40).

The 2006 preliminary yield trial conducted at Pullman, WA for large Kabuli chickpeas had 49 entries and three check entries (Table 41). The Café type selections in the Preliminary trial were chosen for good resistance to ascochyta blight. Most of the new entries were medium to small seeded and had acceptable blight scores. Based on the trial results, twenty-four lines were selected to be either reevaluated or advanced to replicated yield trials in 2007, while the remaining twenty-five lines will be discarded.

The second year preliminary yield trial for Desi type chickpeas was carried out in Pullman in 2006 (Table 42). There were seven entries plus a check 'Myles' tested for high yield and good blight resistance will be tested again at the Pullman location in 2007.

The preliminary screening nursery in 2006 had 147 entries of which 38 lines were selected for further evaluations in 2007. Nearly all of the entries were Café types. The 49 selected lines had acceptable plant type, leaf type, earliness to flower and resistance to ascochyta blight. These are the most promising selections and will be entered in the preliminary yield trial in 2007.

An observation trial of 130 breeding lines from Canada, Australia, ICARDA in Syria and Bulgaria was conducted at Pullman. The lines were evaluated in an unreplicated trial to observe the characteristics and disease resistance of material from other programs. Based on performance, agronomic characteristics and blight resistance scores, several of the lines will be used as parental material.

Disease screening:

Recent results of disease screening in the greenhouse has indicated that the newly released variety Sierra has resistance to pathotypes I and II of the blight pathogen while Dwelley, Sanford and Evans only have resistance to pathotype I. 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 I, II, and III and the incorporation of that germplasm as well as CA04690020C from Bulgaria into the breeding program will be important in the development of improved resistance.

The ascochyta blight nursery established at Spillman Farm continues to be an excellent method of screening for resistance every year. More than 1000 lines and selections from the breeding program and other sources were screened for blight resistance in 2006. Infected chickpea debris from infected plants was gathered for use in 2007 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, usually at night, to ensure good spread of the disease and to promote infection of pods, leaves and stems. In addition to inoculation using infected plant debris, we have the option to also inoculate the trial with laboratory-produced inoculum of isolates of the two pathotypes if required. That inoculum can be prepared from several isolates of the pathogen that represent pathotypes 1 and 2. Scores for infection were made twice, three weeks apart. Selections were made based on these blight scores as well as on plant habit and pod setting. Chickpea lines with low scores, indicating resistance, were retained for further evaluation 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 Bulgaria, 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 2006 and evaluated for resistance to blight and other traits. The primary criteria in the selection process are large seeds of each type, good color and 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 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 attempting to widen this temperature range of adaptation through observation and selection. 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:

The medium seeded Kabuli line CA0090B347C performed well for several years and gained interests from the industry. This line could be released in 2007. This line is a simple leafed type that had exceptionally low blight scores and performed well in yield testing with excellent seed quality traits. CA0090B347C has smaller seed size when compared to Sierra and the seeds are a light colored Café type. The selection has performed exceptionally well in the Western Regional Trials in North Dakota, South Dakota and Nebraska. Pre-breeder seed of CA0090B347C was selected from single plants during the 2006 field season. Seed from these single plants will be grown as single plant rows and harvested as Foundation seed in 2007.

CA9990I875W ‘Troy’ was released in 2006. It is a large seeded Spanish White type selection with excellent size and quality and good resistance to ascochyta blight. Only limited amounts of Breeder seed is available and it will require an additional year of increase before it can be made available to growers.

Table 38. Agronomic Data for the Advanced Large Kabuli Chickpea Yield Trial, 2006 (0681)

Cultivar	Origin	Ascpchyta Blight 1	Ascochyta Blight 2	Days to Flower	Days to Maturity	Pods/ Peduncle	Pod Ht (green)	Pod Ht (mature)	Pod Ht Index	Plant Ht (green)	Plant Ht (mature)	Plant Ht Index	Weight 100 Seed
							..cm..	..cm..		..cm..	..cm..		..g..
CA0469C025C	…	3	4	58	95	1	17	15	0.90	35	35	1.00	35.2
CA0390B007C	X94C003	5	5	59	101	1	21	21	1.00	43	41	0.95	47.9
CA9783163C	X92C017	5	6	60	107	1	24	21	0.86	46	42	0.90	55.5
CA0469C020C	…	3	3	58	94	1	16	14	0.83	34	33	0.96	34.2
CA9890233W	X94C005	4	5	60	101	1	20	18	0.90	38	36	0.94	53.2
SIERRA	…	5	5	59	99	1	21	19	0.90	48	42	0.88	48.0
DYLAN	X94C080	6	6	58	96	1	17	16	0.94	38	35	0.92	54.0
CA0390B440C	X98C020	4	3	59	101	1	17	18	1.06	36	36	1.00	41.7
CA9990I875W	X94C005	5	5	59	104	1	23	19	0.83	42	41	0.98	59.4
CA0090B347C	X96C004	4	4	61	99	1	19	18	0.94	39	39	0.98	42.5
DWELLEY*	…	6	6	64	99	1	21	21	1.03	46	42	0.93	50.0
CA0390B500C	X96C023	4	5	59	98	1	25	23	0.92	48	47	0.99	43.0
CA0290B734C	X96C081	4	5	61	100	1	19	14	0.73	39	34	0.87	46.7
CA0290B720C	X96C081	4	4	59	102	1	21	23	1.06	43	41	0.94	51.3
CA0390B422C	X98C016	5	5	59	36	1	25	28	1.14	52	51	0.98	44.8
CA9990B1579C	X92C016	5	5	59	98	1	20	21	1.06	39	39	0.99	51.2
CA0190B839C	X96C031	6	7	59	100	1	29	26	0.89	54	49	0.91	55.8
CA0390B212C	X96C128	4	4	59	99	1	25	22	0.88	54	48	0.89	43.0
CA0290B730C	X96C081	4	5	61	100	1	21	17	0.83	43	38	0.88	47.7
CA0390B419C	X98C016	5	5	64	38	1	31	36	1.17	55	52	0.94	47.0
Grand Mean		5	5	60	93	1	22	20	0.94	44	41	0.94	47.6
C.V. (%)		11	20	3	21		12	13	14	7	7	9	13.4
LSD $_{(\alpha=0.05)}$		1	1	2	27		4	4	0.18	4	4	0.12	

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

Pod height was measured at the green pod stage and at harvest maturity. Pod height index was determined by dividing pod height at harvest maturity by the green pod height.

Plant height was measured at the green plant stage and at harvest maturity. Plant height index was determined by dividing plant height at harvest maturity by the green plant height.

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

*Check variety.

Table 39. Location Yield Summary (kg/ha) for the Advanced Large Kabuli Chickpea Yield Trial, 2006 (0681)

Cultivar	Origin	Leaf Type	Seed Type	Genesee	Pullman	Mean Seed Yield
CA0469C025C	…	C	C	1522	1506	1514
CA0390B007C	X94C003	C	C	1692	1296	1494
CA9783163C	X92C017	C	C	1495	1474	1485
CA0469C020C	…	C	C	1598	1364	1481
CA9890233W	X94C005	C	W	1477	1464	1470
SIERRA	…	S	C	1366	1537	1451
DYLAN	X94C080	C	W	1366	1501	1433
CA0390B440C	X98C020	C	W	1544	1223	1383
CA9990I875W	X94C005	C	W	1420	1309	1364
CA0090B347C	X96C004	S	C	1401	1301	1351
DWELLEY*	…	S	C	1204	1489	1346
CA0390B500C	X96C023	S	C	1319	1217	1268
CA0290B734C	X96C081	S	C	1340	1186	1263
CA0290B720C	X96C081	C	C	1134	1388	1261
CA0390B422C	X98C016	C	W	1268	1201	1234
CA9990B1579C	X92C016	S	C	942	1426	1184
CA0190B839C	X96C031	S	C	1154	1149	1152
CA0390B212C	X96C128	C	C	1148	1130	1139
CA0290B730C	X96C081	S	C	1098	939	1018
CA0390B419C	X98C016	C	W	998	747	873
Grand Mean				1324	1292	1308
C.V. (%)				15	17	16
LSD $_{(\alpha=0.05)}$				275	306	243
Planting Date				4/26/06	4/28/06	
Harvest Date				8/23/06	8/25/06	

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, over two locations.
*Check variety.

Table 40. Mean Yields of the Advanced Large Kabuli Chickpea Yield Trial, 2002 - 2006

Cultivar	Origin	Leaf Type	Seed Type	2002		2003		2004		2005		2006	
				kg/ha	% check	kg/ha	% check	kg/ha	% check	kg/ha	% check	kg/ha	% check
CA0469C025C	…	C	C	…	…	…	…	…	…	…	…	1514	112
CA0390B007C	X94C003	C	C	…	…	…	…	…	…	…	…	1494	111
CA9783163C	X92C017	C	C	1331	98	980	105	2443	108	1181	131	1485	110
CA0469C020C	…	C	C	…	…	…	…	…	…	…	…	1481	110
CA9890233W	X94C005	C	W	1236	91	864	92	2027	90	1101	122	1470	109
SIERRA	…	S	C	1383	102	990	106	2163	96	1156	128	1451	108
DYLAN	X94C080	C	W	1559	115	950	102	2390	106	1098	122	1433	106
CA0390B440C	X98C020	C	W	…	…	…	…	…	…	…	…	1383	103
CA9990I875W	X94C005	C	W	1300	96	779	83	2273	101	999	111	1364	101
CA0090B347C	X96C004	S	C			1080	116	2482	110	1240	138	1351	100
DWELLEY*	…	S	C	1360	100	935	100	2258	100	901	100	1346	100
CA0390B500C	X96C023	S	C	…	…	…	…	…	…	…	…	1268	94
CA0290B734C	X96C081	S	C	…	…	…	…	…	…	1007	112	1263	94
CA0290B720C	X96C081	C	C	…	…	…	…	…	…	1113	124	1261	94
CA0390B422C	X98C016	C	W	…	…	…	…	…	…	…	…	1234	92
CA9990B1579C	X92C016	S	C	1517	112	1053	113	2306	102	1095	122	1184	88
CA0190B839C	X96C031	S	C	…	…	…	…	2126	94	940	104	1152	86
CA0390B212C	X96C128	C	C	…	…	…	…	…	…	…	…	1139	85
CA0290B730C	X96C081	S	C	…	…	…	…	…	…	1132	126	1018	76
CA0390B419C	X98C016	C	W	…	…	…	…	…	…	…	…	873	65
Grand Mean				1307		948		2195		1048		1308	
LSD $_{(\alpha=0.05)}$				336		112		550		109		243	

Yield data are means of three replications at each location, over three locations in each year and two locations in 2004 and 2006.
*Check variety

Table 41. Agronomic and Yield Data for the Preliminary Large Kabuli Chickpea Yield Trial, 2006 (0683)

Cultivar	Origin	Leaf Type	Seed Type	Ascochyta Blight	Days to Flower	Days to Maturity	Pods/ Peduncle	Pod Ht (green)	Pod Ht (mature)	Pod Ht Index	Plant Ht (green)	Plant Ht (mature)	Plant Ht Index	Weight 100 Seed	Seed Yield
								..cm..	..cm..		..cm..	..cm..		..g..	..kg/ha..
CA04900880C	X00C015	S	C	4.3	61	103	1	17	14	0.83	41	38	0.92	48.0	1396
CA04900421C	X01C014	C	C	5.3	59	98	1	17	16	0.93	42	38	0.91	49.9	1366
CA04900960W	X01C036	C	W	5.3	59	103	1	19	18	1.02	49	46	0.94	56.8	1289
CA04900443C	X01C016	C	C	5.0	60	104	1	21	18	0.83	51	42	0.82	58.3	1284
CA04900761C	X00C015	C	C	5.7	63	107	1	19	18	0.95	42	40	0.94	48.9	1283
CA04900952C	X01C033	C	C	5.0	58	97	1	16	16	1.00	40	35	0.89	41.0	1249
CA04900515C	X01C069	C	C	6.0	59	99	1	22	18	0.84	49	43	0.88	50.9	1211
CA04900785C	X00C015	S	C	6.3	63	99	1	16	16	1.06	44	40	0.92	49.5	1201
CA04900677C	X00C015	S	C	5.7	61	108	1	27	23	0.85	54	47	0.86	55.8	1180
CA04900851C	X00C015	S	C	6.3	62	102	1	24	18	0.76	50	45	0.91	53.1	1175
CA04900466C	X01C033	C	C	6.0	59	100	1	17	15	0.88	40	35	0.89	42.7	1172
CA0490B0047C	X96C007	C	C	5.0	60	104	1	19	15	0.82	42	37	0.90	44.4	1157
CA0469C029C	...	C	C	5.7	60	101	1	25	20	0.80	51	48	0.94	37.7	1130
CA0490B0026C	X96C006	C	C	4.7	59	102	1	22	20	0.89	48	40	0.83	42.6	1129
CA04900716C	X00C015	S	C	6.3	62	101	1	25	21	0.78	45	42	0.93	56.1	1121
CA04900436C	X01C015	C	C	6.0	61	102	1	22	18	0.82	44	39	0.90	56.9	1095
DYLAN	X94C080	C	W	5.0	59	103	1	17	13	0.77	41	34	0.84	52.2	1090
CA04900934C	X01C028	C	C	5.0	59	99	1	17	15	0.86	41	38	0.91	48.7	1090
CA04900707C	X00C015	S	C	4.7	60	97	1	17	18	1.03	44	41	0.95	44.0	1071
CA04900936C	X01C028	C	C	5.3	60	106	1	20	15	0.78	46	37	0.80	52.7	1071
CA0490B0040C	X96C007	C	C	4.3	60	101	1	19	18	0.97	45	39	0.85	41.2	1065
CA04900663C	X00C015	S	C	5.3	61	102	1	24	23	0.98	52	43	0.83	55.8	1039
CA04900509C	X01C068	C	C	5.3	59	102	1	18	15	0.84	42	37	0.89	55.6	1021
CA04900606C	X00C015	S	C	5.7	60	98	1	18	18	1.02	39	37	0.97	52.3	1019
CA04900646C	X00C015	C	C	5.3	59	102	1	21	20	1.00	44	42	0.95	51.6	1018
CA0490B0055C	X96C015	C	C	5.0	59	109	1	17	13	0.77	40	39	0.98	47.2	998
CA04900733C	X00C015	S	C	5.7	59	100	1	19	20	1.12	44	43	0.97	54.6	997
CA04900595C	X01C108	S	C	6.3	62	102	1	18	14	0.78	34	34	1.05	46.7	977
CA04900556C	X01C087	C	C	5.7	59	99	1	19	18	0.97	49	42	0.89	47.0	974
CA04900820C	X00C015	S	C	6.0	63	106	1	24	22	0.92	49	41	0.84	53.3	972
CA04900361C	X01C001	S	C	6.7	59	101	1	21	18	0.87	52	44	0.83	50.3	969
CA04900479C	X01C035	S	C	7.3	58	101	1	22	19	0.88	51	44	0.85	56.7	969
SIERRA	...	S	C	5.7	60	104	1	18	18	0.96	47	41	0.87	48.1	960
CA04900372C	X01C003	C	C	4.3	59	111	1	20	17	0.88	42	41	0.96	55.9	958
CA04900611C	X00C015	S	C	5.0	59	100	1	19	17	0.87	42	39	0.93	52.8	944
CA04900822C	X00C015	S	C	6.0	62	102	1	22	21	0.99	45	41	0.90	48.9	930
CA04900554W	X01C087	C	W	6.0	59	104	1	18	15	0.83	48	41	0.86	47.5	925
CA04900965C	X01C038	C	C	5.3	60	105	1	18	18	1.01	47	40	0.85	50.1	917
CA0490B0045C	X96C007	C	C	4.3	61	110	1	19	14	0.76	43	28	0.65	47.1	882
CA04900812C	X00C015	C	C	5.3	59	97	1	18	17	0.96	40	40	1.01	44.7	875
CA04900369C	X01C003	C	C	6.7	59	111	1	15	15	1.00	38	36	0.95	60.8	863
CA04900608C	X00C015	S	C	5.3	62	100	1	21	19	0.92	50	37	0.75	55.7	829
CA04900612C	X00C015	S	C	4.7	60	107	1	21	19	0.90	51	45	0.90	58.8	827

Cultivar	Origin	Leaf Type	Seed Type	Ascochyta Blight	Days to Flower	Days to Maturity	Pods/ Peduncle	Pod Ht (green)	Pod Ht (mature)	Pod Ht Index	Plant Ht (green)	Plant Ht (mature)	Plant Ht Index	Weight 100 Seed	Seed Yield
								..cm..	..cm..		..cm..	..cm..		..g..	..kg/ha..
CA0469C028C	...	C	C	5.0	60	101	1	29	21	0.75	53	50	0.95	39.1	806
CA04900740C	X00C015	S	C	6.0	62	99	1	22	18	0.86	44	42	0.95	50.6	792
CA04900386C	X01C005	C	C	6.0	59	106	1	17	17	0.98	40	36	0.90	52.7	759
CA04900385C	X01C005	S	C	5.0	59	105	1	20	17	0.87	46	40	0.87	50.5	746
CA0490B0172C	X96C004	S	C	5.3	62	97	1	24	22	0.93	50	45	0.89	42.3	733
CA0490B0033C	X96C006	C	C	4.7	60	105	1	21	17	0.83	44	37	0.84	39.3	731
CA0490B0202C	X96C023	S	C	5.7	62	103	1	20	19	0.98	43	41	0.94	41.4	725
DWELLEY	...	S	C	5.7	64	108	1	20	18	0.95	41	42	1.02	51.5	713
CA04900535C	X01C075	C	C	5.7	60	111	1	19	19	1.02	45	39	0.87	60.4	629
Grand Mean					60	103	1	20	18	0.90	45	40	0.90	50.0	1006
C.V. (%)					2.30	4.72		14.36	15.25	19.29	7.31	9.70	11.25	3.3	15.7
LSD $_{(\alpha=0.05)}$					1.88	6.57		3.89	3.67	0.24	4.46	5.28	0.12	2.2	213.61

Pullman planting date was 4/28/06. Pullman harvest date was 8/25/06.

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

Pod height was measured at the green pod stage and at harvest maturity. Pod height index was determined by dividing 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 plant height at harvest maturity by the green plant height.

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

Table 42. Agronomic and Yield Data for the Preliminary Large Kabuli Chickpea Yield Trial, 2006 (0684)

Cultivar	Origin	Leaf Type	Seed Type	Days to Flower	Days to Maturity	Pod Ht (green)	Pod Ht (mature)	Pod Ht Index	Plant Ht (green)	Plant Ht (mature)	Plant Ht Index	Weight 100 Seed	Seed Yield
						..cm..	..cm..		..cm..	..cm..		..g..	.kg/ha.
CA04900456D	X01C024	C	D	60	96	18	18	0.98	40	42	1.05	29.1	3023
CA04900459D	X01C025	C	D	58	95	16	16	1.02	38	39	1.03	31.3	3000
CA0490B0223D	X00C001	C	D	59	102	13	11	0.82	30	35	1.17	31.3	2699
CA0490B0225D	X00C001	C	D	60	100	11	8	0.77	30	29	0.96	26.3	2568
CA0490B0224D	X00C001	C	D	55	110	12	10	0.88	32	33	1.02	29.7	2133
MYLES		C	D	59	94	14	16	1.17	36	37	1.03	16.6	1827
CA0490B0221D	X00C001	C	D	58	97	10	9	0.94	23	28	1.21	23.5	1727
CA0490B0214D	X00C001	C	D	59	106	14	11	0.84	32	35	1.08	25.4	1708
Grand Mean				58	100	14	13	0.93	33	35	1.07	26.7	2336
C.V. (%)				2	4	12	20	23.86	7	7	6.18	17.4	21
LSD $_{(\alpha=0.05)}$				2	6	2	4	0.32	3	4	0.10	0	719

Pullman planting date was 4/28/06. Pullman harvest date was 8/28/06.

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

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

Pod height was measured at the green pod stage and at harvest maturity. Pod height index was determined by dividing 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 plant height at harvest maturity by the green plant height.

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

Table 43. Agronomic and Yield Data for the Preliminary Large Kabuli Chickpea Screening Nursery, 2006 (0685)

Cultivar	Origin	Leaf Type	Seed Type	Ascochyta Blight	Days to Flower	Days to Maturity	Pods/ Ped	Pod Ht (green)	Pod Ht (mature)	Pod Ht Index	Plant Ht (green)	Plant Ht (mature)	Plant Ht Index	Weight 100 Seed	Seed Yield
								..cm..	..cm..		..cm..	..cm..		..g..	..kg/ha..
CA04900789C	X00C015	S	C	3	60	104	1	24	16	0.67	42	34	0.81	48.3	1445
CA04900728C	X00C015	S	C	5	60	104	1	19	19	1.00	37	39	1.05	50.2	1235
CA04900651C	X00C015	S	C	5	61	104	1	25	18	0.72	46	41	0.89	49.9	1187
CA04900808C	X00C015	S	C	5	60	101	1	17	20	1.18	52	46	0.88	52.3	1170
CA04900641C	X00C015	C	C	5	60	104	1	16	16	1.00	32	36	1.13	47.3	1154
CA05900090C	X00C014	C	C	6	60	108	1	24	25	1.04	55	42	0.76	48.7	1150
CA05900094C	X00C014	C	C	6	60	115	1	22	16	0.73	51	45	0.88	52.2	1148
CA04900843C	X00C015	C	C	6	61	111	1	19	16	0.84	38	34	0.89	58.3	1141
CA05900092C	X00C014	C	C	4	60	115	1	17	16	0.94	42	34	0.81	46.6	1127
CA04901031C	X01C073	S	C	5	61	104	1	23	27	1.17	44	43	0.98	45.6	1061
CA04900667C	X00C015	S	C	5	60	103	1	19	20	1.05	47	42	0.89	57.5	1042
CA05900091C	X00C014	C	C	6	60	108	1	24	25	1.04	55	46	0.84	47.7	1034
CA05900087C	X00C014	C	C	5	60	108	1	22	20	0.91	49	40	0.82	47.3	1013
CA04900765C	X00C015	S	C	5	63	115	1	25	19	0.76	47	39	0.83	53.1	1005
CA05900113C	X00C014	C	C	6	60	108	1	23	15	0.65	50	43	0.86	50.1	1001
CA05900077C	X00C014	C	C	5	60	108	1	20	15	0.75	47	41	0.87	53.0	968
CA04900726C	X00C015	S	C	5	60	103	1	19	18	0.95	40	38	0.95	47.5	964
CA04900804C	X00C015	S	C	5	60	103	1	21	16	0.76	46	40	0.87	48.4	957
CA05900070C	X00C014	C	C	5	60	108	1	19	17	0.89	46	36	0.78	49.3	945
CA04900630C	X00C015	S	C	5	63	104	1	17	18	1.06	39	35	0.90	48.9	900
CA04900948C	X01C030	C	C	5	60	108	1	18	16	0.89	48	38	0.79	53.6	887
DWELLEY	...	S	C	5	68	111	1	19	16	0.84	37	41	1.11	51.5	854
DYLAN	X94C080	C	W	5	61	115	1	16	15	0.94	35	33	0.94	53.8	852
CA04900376C	X01C004	C	C	5	60	108	1	18	17	0.94	46	40	0.87	58.3	825
CA05900068C	X00C014	C	C	4	56	100	1	27	....	....	50	....	....	50.5	689
CA05900058C	X00C014	C	C	5	56	100	1	21	....	....	50	....	....	46.7	662
CA05900052C	X00C014	C	C	6	56	111	1	23	....	....	47	....	....	51.0	641
CA05900060C	X00C014	C	C	6	56	100	1	22	....	....	56	....	....	52.2	622
CA05900064C	X00C014	C	C	5	56	99	1	27	....	....	52	....	....	51.9	606
CA05900065C	X00C014	C	C	6	56	100	1	24	....	....	53	....	....	51.8	602
SIERRA	...	S	C	5	61	104	1	20	17	0.85	37	36	0.97	46.1	598
CA05900102C	X00C014	C	C	5	57	97	1	19	....	....	47	....	....	52.4	581
CA05900066C	X00C014	C	C	5	56	100	1	28	....	....	59	....	....	53.4	573
CA05900054C	X00C014	C	C	6	56	100	1	26	....	....	53	....	....	50.3	550
CA05900104C	X00C014	C	C	5	57	104	1	24	....	....	40	....	....	53.4	546
CA05900061C	X00C014	C	C	5	56	99	1	17	....	....	51	....	....	48.8	542
CA05900062C	X00C014	C	C	6	56	100	1	23	....	....	52	....	....	53.2	540
CA05900063C	X00C014	C	C	5	56	107	1	25	....	....	55	....	....	50.4	531
CA05900075C	X00C014	C	C	6	56	111	1	24	....	....	48	....	....	54.8	521
CA05900071C	X00C014	C	C	5	56	99	1	21	....	....	55	....	....	51.7	509

Cultivar	Origin	Leaf Type	Seed Type	Ascochyta Blight	Days to Flower	Days to Maturity	Pods/ Ped	Pod Ht (green)	Pod Ht (mature)	Pod Ht Index	Plant Ht (green)	Plant Ht (mature)	Plant Ht Index	Weight 100 Seed	Seed Yield
								..cm..	..cm..		..cm..	..cm..		..g..	..kg/ha..
CA05900057C	X00C014	C	C	7	56	99	1	21	....	....	51	....	....	43.2	507
CA05900051C	X00C014	C	C	6	56	100	1	22	....	....	54	....	....	45.5	498
CA05900080C	X00C014	C	C	6	56	99	1	21	....	....	49	....	....	52.5	496
CA05900095C	X00C014	C	C	5	59	100	1	23	....	....	50	....	....	41.0	488
CA04900662C	X00C015	S	C	5	57	97	1	22	....	....	52	....	....	60.0	476
CA0590B0563C	X00C015	C	C	5	59	104	1	26	....	....	50	....	....	47.9	465
CA05900050C	X00C014	C	C	6	56	107	1	24	....	....	54	....	....	43.7	453
CA0590B0229C	X96C026	C	C	5	60	96	1	23	20	0.87	52	50	0.96	39.1	449
CA05900088C	X00C014	C	C	6	56	100	1	21	....	....	48	....	....	51.4	449
CA05900056C	X00C014	C	C	6	56	111	1	17	....	....	53	....	....	49.2	440
CA05900011C	X00C008	C	C	6	59	104	1	20	....	....	47	....	....	49.9	438
CA05900008C	X00C008	C	C	5	59	104	1	19	....	....	41	....	....	36.4	424
CA05900042C	X00C014	C	C	6	56	100	1	12	....	....	47	....	....	49.6	420
CA05900084C	X00C014	C	C	6	56	100	1	26	....	....	50	....	....	49.0	420
CA05900044C	X00C014	C	C	6	57	104	1	18	....	....	54	....	....	43.3	416
CA05900083C	X00C014	C	C	6	56	100	1	26	....	....	48	....	....	52.9	416
CA0590B0257C	X98C024	C	C	6	59	111	1	29	....	....	61	....	....	41.7	407
CA05900026C	X00C010	C	C	6	59	107	1	26	....	....	43	....	....	48.6	405
CA05900089C	X00C014	C	C	5	56	100	1	20	....	....	62	....	....	46.0	395
CA05900049C	X00C014	C	C	6	56	104	1	18	....	....	53	....	....	45.4	393
CA05900116C	X00C014	C	C	6	56	100	1	26	....	....	51	....	....	45.3	389
CA05900034C	X00C010	C	C	6	59	104	1	20	....	....	50	....	....	42.0	383
CA05900156C	X00C014	C	C	5	56	100	1	17	....	....	47	....	....	46.5	381
CA05900047C	X00C014	C	C	5	56	104	1	15	....	....	43	....	....	44.2	378
CA05900131C	X00C014	C	C	7	57	107	1	27	....	....	49	....	....	48.6	378
CA05900031C	X00C010	C	C	7	57	99	1	20	....	....	44	....	....	48.9	376
CA0590B0240C	X98C010	C	C	3	59	104	1	20	....	....	53	....	....	43.0	376
CA0590B0237C	X98C010	C	C	4	59	100	1	22	....	....	50	....	....	44.1	374
CA05900140C	X00C014	C	C	5	56	104	1	25	....	....	50	....	....	43.2	364
CA05900018C	X00C010	C	C	6	59	100	1	22	....	....	46	....	....	47.2	347
CA05900043C	X00C014	C	C	6	57	104	1	18	....	....	37	....	....	39.9	343
CA05900158C	X00C014	C	C	5	56	100	1	22	....	....	44	....	....	44.5	343
CA05900151C	X00C014	C	C	6	56	100	1	18	....	....	47	....	....	49.0	341
CA05900155C	X00C014	C	C	6	56	99	1	21	....	....	49	....	....	46.4	335
CA05900086C	X00C014	C	C	5	56	104	1	18	....	....	53	....	....	44.7	318
CA0590B0509C	X00C015	C	C	5	59	99	1	23	....	....	50	....	....	45.4	312
CA05900143C	X00C014	C	C	5	56	99	1	18	....	....	49	....	....	51.3	310
CA0590B0210C	X96C001	C	C	4	56	99	1	21	....	....	51	....	....	49.1	306
CA0590B0236C	X96C128	C	C	5	57	104	1	21	....	....	53	....	....	44.6	302
CA05900020C	X00C010	C	C	6	64	104	1	21	....	....	42	....	....	47.9	298

Table 43. Agronomic and Yield Data for the Preliminary Large Kabuli Chickpea Screening Nursery, 2006 (0685)

Cultivar	Origin	Leaf Type	Seed Type	Ascochyta Blight	Days to Flower	Days to Maturity	Pods/ Ped	Pod Ht (green)	Pod Ht (mature)	Pod Ht Index	Plant Ht (green)	Plant Ht (mature)	Plant Ht Index	Weight 100 Seed	Seed Yield
								..cm..	..cm..		..cm..	..cm..		..g..	..kg/ha..
CA05900082C	X00C014	C	C	5	56	100	1	22	....	....	56	....	....	51.1	287
CA05900149C	X00C014	C	C	4	56	104	1	21	....	....	51	....	....	46.4	283
CA0590B0211C	X96C001	C	C	5	56	94	1	23	....	....	47	....	....	42.7	273
CA05900134C	X00C014	C	C	7	56	104	1	23	....	....	51	....	....	43.2	265
CA05900028C	X00C010	C	C	6	59	104	1	25	....	....	42	....	....	47.8	219
CA0590B0658C	X01C007	C	C	5	62	104	1	25	....	....	49	....	....	43.7	114
CA0590B0634C	X01C006	C	C	5	65	100	1	24	....	....	55	....	....	45.5	103
CA04900908C	X01C002	S	C	5	59	111	1	20	17	0.85	40	39	0.98	....	....
CA05900012C	X00C008	C	C	6	59	111	0	0	15	0.00	0	39	0.00	....	....
CA05900024C	X00C010	C	C	5	64	111	1	19	15	0.79	38	38	1.00	....	....
CA05900025C	X00C010	C	C	5	65	111	1	23	16	0.70	43	39	0.91	....	....
CA05900032C	X00C010	C	C	6	59	100	1	17	16	0.94	38	38	1.00	....	....
CA05900035C	X00C010	C	C	7	65	114	1	15	14	0.93	36	37	1.03	....	....
CA05900037C	X00C010	C	C	7	64	114	1	15	13	0.87	32	32	1.00	....	....
CA05900053C	X00C014	C	C	5	56	111	1	22	16	0.73	48	42	0.88	....	....
CA05900055C	X00C014	C	C	6	56	114	1	17	16	0.94	42	42	1.00	....	....
CA05900072C	X00C014	C	C	4	56	111	1	23	16	0.70	52	42	0.81	....	....
CA05900073C	X00C014	C	C	5	56	114	1	23	20	0.87	55	49	0.89	....	....
CA05900076C	X00C014	C	C	5	56	111	1	21	16	0.76	49	45	0.92	....	....
CA05900078C	X00C014	C	C	6	56	100	1	13	16	1.23	42	38	0.90	....	....
CA05900079C	X00C014	C	C	5	56	100	1	26	20	0.77	49	49	1.00	....	....
CA05900081C	X00C014	C	C	5	56	99	1	21	16	0.76	44	42	0.95	....	....
CA05900085C	X00C014	C	C	6	56	104	1	18	19	1.06	44	38	0.86	....	....
CA05900099C	X00C014	C	C	5	57	100	1	24	16	0.67	43	41	0.95	....	....
CA05900105C	X00C014	C	C	5	56	100	1	16	13	0.81	42	37	0.88	....	....
CA05900110C	X00C014	C	C	5	56	100	1	20	16	0.80	47	42	0.89	....	....
CA05900112C	X00C014	C	C	6	56	100	1	26	19	0.73	48	41	0.85	....	....
CA05900118C	X00C014	C	C	7	59	111	1	19	13	0.68	42	43	1.02	....	....
CA05900120C	X00C014	C	C	7	59	100	1	22	14	0.64	41	45	1.10	....	....
CA05900130C	X00C014	C	C	7	57	114	1	26	18	0.69	53	46	0.87	....	....
CA05900132C	X00C014	C	C	7	56	114	1	19	21	1.11	45	46	1.02	....	....
CA05900133C	X00C014	C	C	6	56	111	1	21	20	0.95	47	46	0.98	....	....
CA05900138C	X00C014	C	C	7	56	100	1	19	18	0.95	37	46	1.24	....	....
CA05900146C	X00C014	C	C	5	56	104	1	22	18	0.82	52	46	0.88	....	....
CA05900150C	X00C014	C	C	5	65	114	1	20	20	1.00	49	39	0.80	....	....
CA05900152C	X00C014	C	C	6	56	99	1	24	16	0.67	47	49	1.04	....	....
CA05900159C	X00C014	C	C	5	56	97	1	20	15	0.75	41	38	0.93	....	....
CA05900162C	X00C014	C	C	5	57	107	2	15	16	1.07	39	37	0.95	....	....
CA05900183C	X00C014	C	C	5	56	100	1	17	15	0.88	38	34	0.89	....	....
CA05900187C	X00C014	C	C	5	59	100	1	20	15	0.75	38	39	1.03	....	....

Cultivar	Origin	Leaf Type	Seed Type	Ascochyta Blight	Days to Flower	Days to Maturity	Pods/ Ped	Pod Ht (green)	Pod Ht (mature)	Pod Ht Index	Plant Ht (green)	Plant Ht (mature)	Plant Ht Index	Weight 100 Seed	Seed Yield
								..cm..	..cm..		..cm..	..cm..		..g..	..kg/ha..
CA05900195C	X00C015	C	C	5	59	111	1	16	13	0.81	46	35	0.76	....	....
CA05900201C	X00C015	C	C	4	57	111	1	17	18	1.06	42	41	0.98	....	....
CA0590B0209C	X96C001	C	C	5	56	99	1	20	26	1.30	52	48	0.92	....	....
CA0590B0212C	X96C004	C	C	4	56	94	1	27	18	0.67	52	42	0.81	....	....
CA0590B0222C	X96C015	C	C	5	56	99	1	16	14	0.88	39	38	0.97	....	....
CA0590B0234C	X96C128	C	C	6	59	100	1	18	18	1.00	43	40	0.93	....	....
CA0590B0246C	X98C016	C	C	5	56	114	1	20	21	1.05	44	49	1.11	....	....
CA0590B0361C	X00C015	C	C	6	59	111	1	22	19	0.86	47	43	0.91	....	....
CA0590B0394C	X00C015	C	C	3	0	115	1	25	10	0.40	47	38	0.81	....	....
CA0590B0395C	X00C015	C	C	4	66	115	1	20	17	0.85	42	38	0.90	....	....
CA0590B0397C	X00C015	C	C	4	71	115	1	27	15	0.56	55	47	0.85	....	....
CA0590B0434C	X00C015	C	C	4	62	111	1	20	17	0.85	41	43	1.05	....	....
CA0590B0435C	X00C015	C	C	5	59	111	1	19	15	0.79	41	37	0.90	....	....
CA0590B0508C	X00C015	C	C	5	59	99	1	23	17	0.74	44	41	0.93	....	....
CA0590B0527C	X00C015	C	C	4	59	100	1	21	14	0.67	41	38	0.93	....	....
CA0590B0538C	X00C015	C	C	4	59	100	1	20	22	1.10	46	41	0.89	....	....
CA0590B0564C	X00C015	C	C	5	59	111	1	8	16	2.00	38	40	1.05	....	....
CA0590B0569C	X00C015	C	C	5	59	100	1	35	23	0.66	49	41	0.84	....	....
CA0590B0849C	X01C095	C	C	7	56	111	1	14	12	0.86	44	38	0.86	....	....
CA0590B0850C	X01C095	C	C	7	59	111	15	17	38	2.24	50	....	....	....	....
Grand Mean				5	58	105	1	21	17	0.88	46	41	0.91	48.4	595

Pullman planting date was 4/28/06. Pullman harvest date was 8/28/06.

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

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

Pod height was measured at the green pod stage and at harvest maturity. Pod height index was determined by dividing 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 plant height at harvest maturity by the green plant height.

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

Field Evaluation of Fungicides for Control of Ascochyta Blight of Chickpea

To evaluate foliar fungicides against Ascochyta bligt of chickpea caused by *Ascochyta rabiei*, field plots were set up at Pullman, WA and Genesee, ID. The fungicide trials were in a split plot arrangement of a randomized complete block design with four replications, with fungicides as the main plots and cultivars ('Dwelley' resistant to Ascochyta blight) and 'Spanish White' susceptible to Ascochyta blight) as the split plots (16 ft X 6.5 ft with eight rows of plants). The same experimental design was used at both locations. Seeds (400/plot) were planted on 26 Apr in Genesee and 3 May in Pullman. Natural inoculum of *Ascochyta rabiei* was abundant, so no artificial inoculations were used. The plots were sprayed with fungicides on 1, 15 and 30 Jun, at both locations with a backpack CO_2-assisted sprayer set at 20 psi at a volume of 20 gpa. Disease severity of each whole plot was evaluated on 15 and 30 Jun and 20 Jul based on a 1-to-9 scale, where: 1 = no lesions visible (healthy plants); 2 = lesions visible but inconspicuous; 3 = a few lesions visible, with <10% of the plant diseased; 4 = 10-20% of the plants showing symptoms, with no stem girdling; 5 = 21-30% of the plant tissue diseased, with some stem girdling; 6 = 41-60% of the plant tissue diseased, with moderate stem girdling and lodging; 7 = 61-80% of the plant tissue diseased, with stem girdling and lodging common; 8 = 81-90% of the plant tissue diseased; 9 = >90% of the plants dead. Weather conditions were conducive to the disease in May and Jun with total monthly precipitation of 1,45 and 1.75 in., respectively, but were hot and dry in Jul and Aug with 0.0 and 0.14 in. of rainfall, respectively. Sprinkler irrigation was implemented in June in Pullman. Plots were harvested using a plot combine on 22 Aug in Genesee and 31 Aug in Pullman.

Disease pressure was higher at the Pullman location than the Genesee location. Analyses of variance (ANOVAs) showed significant differences in disease severity among fungicide treatments and between cultivars and significant interactions between fungicide and cultivar treatments at both locations. No significant differences in 100 seed weights and plot yields among main plot treatments were detected. At Genesee, all fungicide treatments reduced disease severity. At the Pullman location, all fungicide treatments reduced disease severity of 'Spanish White', with the most significant effects resulting from applications of Proline and Quadris opti. For 'Dwelley', treatments with Proline and Quadris opti consistently reduced disease severity on all three rating dates. In summary, all fungicide treatments tested provided are effective to certain degree against Ascochyta blight. The lack of yield response was due to uneven plant stands causing unusual high levels of variation among replications.

Table 44. Chickpea Fungicide Trial, 2006 (0695)

	Spanish White					Dwelley				
	Disease severity			100	Yield	Disease severity			100 sd	Yield
Fungicide treatment (rate/A)	15 Jun	30 Jun	20 Jul	sd wt	lb/A	15 Jun	30 Jun	20 Jul	wt	lb/A
Genesee, ID										
Control (water) …….	3.00	3.25	3.50	51	1350	1.75	1.75	1.50	46	1226
Bravo Weather Stik 1.4 pt ..	1.00	1.00	1.00	51	1652	1.00	1.00	1.00	45	1090
Headline 10.4 fl oz …….	1.25	1.00	1.00	54	1540	1.00	1.00	1.00	45	978
Proline 5.7 fl oz ……..	1.00	1.00	1.00	50	1585	1.00	1.00	1.00	45	1128
Quadris opti 2 pints ...	1.25	1.25	1.00	54	1773	1.00	1.00	1.00	47	1268
Tanos 8 oz ……	1.75	1.75	1.25	51	1376	1.00	1.00	1.00	46	1060
$LSD_{0.05}$*……	0.50	0.56	0.37	NS**	NS**	0.50	0.56	0.37	NS**	NS**
Pullman, WA										
Control (water) …….	6.25	7.00	6.25	59	153	3.75	3.75	2.75	52	642
Bravo Weather Stik 1.4 pt ..	5.00	4.00	2.75	57	439	3.25	2.50	2.00	53	535
Headline 10.4 fl oz …….	4.50	3.75	2.75	61	800	3.00	2.50	2.25	53	579
Proline 5.7 fl oz ……..	2.00	1.75	1.75	60	391	1.75	1.50	1.50	52	262
Quadris opti 2 pints ...	1.25	1.25	1.25	63	1128	1.25	1.00	1.00	54	578
Tanos 8 oz ……	3.00	2.75	2.75	62	878	2.00	2.00	1.75	58	518
$LSD_{0.05}$*……	0.82	0.79	0.83	NS**	NS**	0.82	0.79	0.83	NS**	NS**

* Fisher's protected least significant difference (LSD) values are for main-plot effects and within-column comparisons.

** No significant differences