

**PROJECT TITLE:** Western Regional Dry Pea and Lentil Trials

**EXPERIMENT NO.:** #8107; 8607

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**OBJECTIVES:**

To evaluate dry pea and lentil lines for grain production potential in Central Montana's dryland environment.

**METHODS:**

The Western Regional Dry Pea Trial (WRPT) consisted of nine dry pea lines from the USDA-ARS breeding program at Pullman, Washington, and Majoret green pea as a check. The Western Regional Lentil Trial (WRLT) consisted of 12 lentil lines from the USDA-ARS program. The dry pea selections included smooth green and smooth yellow peas (**Table 1**), while the lentil trial consisted of six different commercially separate types (Laird, Brewer, Chilean, Turkish, Eston and Pardina-types). The trials were both seeded no-till into winter wheat stubble on May 7, 2003 (**Table 2**). The dry pea trial was harvested on July 30, 2003. The lentil trial was harvested July 30, and August 11, 2003. Additional trial production methods can be found in **Table 2**.

**RESULTS:**

Despite receiving more than three-times the monthly average precipitation in April, crop year (April through August) precipitation was 85 percent of normal (8.73 inches vs. 10.24 inches), as severe drought like conditions continued in Central Montana. A severe infestation of grasshoppers plagued Central Ag. Research Center (CARC). These factors, coupled with the late seeding date (May 7<sup>th</sup>), resulted in much below normal pulse grain yields.

**DRY PEA TRIAL:**

**Grain Yields:** The dry pea trial averaged only 512 pounds of dry pea production per acre (**Table 3**). Selection PS810346 green pea had the highest grain production but was not significantly different from any other line evaluated (based on  $LSD_{(0.05)}$ ). **Kernel Weights:** The average dry pea seed size for the trial was 153 grams per 1,000 kernels and the average test weight was 60.0 pounds per bushel (**Table 3**). The green pea selection PS9910188 had the largest seed size (1,000 kernel weight). Line PS9910592 yellow pea had the highest test weight but was not significantly higher than the other selections tested. **Plant Heights:** Majoret green pea had the tallest grain maturity plant canopy height (**Table 3**). **Growth Stage Dates:** Although not replicated, line PS810162 and PS9910346 peas were the first selections to reach flower (**Table 3**).

**LENTIL TRIAL:**

**Grain Yields:** The lentil grain trial averaged only 281 pounds of lentil grain production per acre (**Table 4**). The Turkish-type line LC99602712T red lentil had the greatest production (474 lbs/acre), but was statistically similar to four other lines. Extreme heat and lack of moisture along with grasshopper pressures appeared to affect the later maturing lines harder than the earlier maturing lines. **Kernel Weights:** As expected, there were differences in seed size among the lines tested (**Table 4**). The Laird-type lentil lines were largest. The test weight averaged 62 pounds per bushel for those lines where samples sizes were sufficient to perform test weight. The Turkish-type line LC99602724T had the heaviest test weight at 65 pounds per bushel. **Plant Heights:** Laird-type lentil line LC9960273L was the tallest entry at grain maturity (**Table 4**), but was not significantly taller than two other lines. **Growth Stage Dates:** Merritt, and line LC00600812P (Pardina-type) lentils were the earliest lines to reach flower (data not replicated; **Table 4**).

**FUTURE PLANS:** Western Regional dry pea and lentil trials will continue at Moccasin.

Table 1. 2003 Western Regional Dry Pea and Lentil Trial - Dry pea variety characteristics summary.  
 - Exp. 81&860703. Central Ag. Research Center, Moccasin, MT. {File: 810703:Character}

**PEA TRIAL:**

Selection	Seed Source	Type	Useage	Seed Size <sup>2/</sup>	Vine Length	Leaf Type
Majoret	Central Ag.	Smooth Green	Food/Feed	Medium	Semi-dwarf	Semi-leafless
PS610152	USDA-ARS	Smooth Green	Food/Feed	Medium	Semi-dwarf	Semi-leafless
PS710048	USDA-ARS	Smooth Green	Food/Feed	Medium	Semi-dwarf	Semi-leafless
PS810162	USDA-ARS	Smooth Green	Food/Feed	Medium	Semi-dwarf	Semi-leafless
PS810191	USDA-ARS	Smooth Green	Food/Feed	Medium	Semi-dwarf	Semi-leafless
PS810240	USDA-ARS	Smooth Green	Food/Feed	Medium	Semi-dwarf	Semi-leafless
PS9910346	USDA-ARS	Smooth Green	Food/Feed	Medium	Semi-dwarf	Semi-leafless
PS9910592	USDA-ARS	Smooth Green	Food/Feed	Medium	Semi-dwarf	Semi-leafless
PS9910140	USDA-ARS	Smooth Green	Food/Feed	Medium	Semi-dwarf	Semi-leafless
PS9910188	USDA-ARS	Smooth Green	Food/Feed	Large	Semi-dwarf	Semi-leafless

<sup>1/</sup> - Seed Size Ranges (g/1000 seeds) :

Very Large = >290-295  
 Large = 250-290

Medium = 190-250  
 Small = <190

**LENTIL TRIAL:**

Variety	Seed Source	Type	Color		Size	Maturity
			Seedcoat	Cotyledon	Class <sup>1/</sup>	
Pennell	USDA-ARS	Laird	Green	Yellow	Large	Medium
LC860359L	USDA-ARS	Laird	Green	Yellow	Large	Late
LC9960273L	USDA-ARS	Laird	Green	Yellow	Large	Late
LC99602075L	USDA-ARS	Laird	Green	Yellow	Large	Medium
Merritt	USDA-ARS	Brewer	Green	Yellow	Large	Early
LC760209C	USDA-ARS	Chilean	Green	Yellow	Large	Medium
LC00600831E	USDA-ARS	Eston	Green	Yellow	Small	Medium
LC00600854E	USDA-ARS	Eston	Green	Yellow	Small	Medium
LC99602712T	USDA-ARS	Turkish	Red	Red	Small	Medium
LC99602724T	USDA-ARS	Turkish	Red	Red	Small	Medium
LC99602427P	USDA-ARS	Pardina	Brown	Yellow	Small	Medium
LC00600812P	USDA-ARS	Pardina	Brown	Yellow	Small	Early

<sup>1/</sup> - Size Classes (g/1000 seeds):

Large: >60-65; Medium: 50-60; Small <50)

Table 2. 2003 Western Regional Dry Pea and Lentil Trials - Moccasin trial management summary.  
 - Exp. 81&860703. Central Agricultural Research Center, Moccasin, MT. **{File: 810703:Manage}**

Field Summary						
Environment:	Dryland					
Tillage History:	No-Till	Previous Crop:	Winter Wheat			
Trial Management						
Seeding Date:	5/7	Plot Dimensions:	5-rows x 11" spacing x 16'			
Fertilizer: (lbs/ac)	None					
Pesticides:(rates)	Assure II (10 oz/ac) - Post Emergence (6/19/02) Malathion - Applied to control grasshopper infestation					
Harvest Dates:		Dry Pea:	7/30	} Timing: At grain maturity		
-Using a 5' plot harvester		Lentil:	7/30&8/11			
Precipitation:	4.49"	- Crop-year (5/1 - 7/31)				
Elevation:	4300'					

Table 3. 2003 Western Regional Dry Pea Trial - Dry Pea agronomic summary.  
 - Exp: 810703 Central Ag Research Center, Moccasin, MT. **{File: 810703-Summary}**

Selection	Flower	Plant Ht	Grain Harvest			
			Yield	Test	Moisture	1,000 Kernel
PS9910346	6/27	10.7	<b>583</b> <sup>n</sup>	62.2	11.3	153
PS610152	6/29	11.1	580	63.0	11.6	142
PS810162	6/26	10.6	535	61.4	11.5	165
PS9910592	6/30	10.5	532	<b>63.2</b> <sup>n</sup>	11.8 <sup>a</sup>	152
PS810191	7/3	10.7	530	60.8	<b>12.0</b> <sup>a</sup>	141
PS710048	7/3	11.3	518	60.1	11.8 <sup>a</sup>	153
PS9910188	7/2	12.5	513	60.7	11.9 <sup>a</sup>	<b>182</b> <sup>a</sup>
PS9910140	7/3	11.9	499	58.2	11.6	146
Majoret	7/3	<b>14.4</b> <sup>a</sup>	425	54.1	11.6	151
PS810240	7/4	13.8 <sup>a</sup>	409	56.0	11.8 <sup>a</sup>	140
Means (n = 40)	7/1	11.8	512	60.0	11.7	153
LSD (0.05 by t)		1.5	161	6.8	0.2	10
CV% (s/mean)		8.6	21.6	7.8	1.3	4.7
F-Value		7.39	1.06 <sup>n</sup>	1.64 <sup>n</sup>	7.27	12.83

<sup>a</sup> - Denotes values equal highest value (in **bold**) based on LSD<sub>(0.05)</sub>.

<sup>n</sup> - Denotes not statistically significant at 0.05 level.

Table 4. 2003 Western Regional Lentil Trial - Lentil agronomic summary.  
 - Exp: 860703 Central Ag. Research Center, Moccasin, MT.

{File: 860703-Summary}

Selection	Flower	Plant Height	Yield	Test	1,000 Kernels
LC99602712T	7/1	9.0	<b>474.2</b> <sup>a</sup>	64.9	28.2
LC00600812P	6/30	9.5	460.1 <sup>a</sup>	63.4	30.7
LC00600831E	7/2	9.6	430.7 <sup>a</sup>	62.5	31.4
LC99602427P	7/1	9.9	424.1 <sup>a</sup>	62.3	35.2
LC99602724T	7/1	8.9	407.1 <sup>a</sup>	<b>65.0</b> <sup>u</sup>	27.0
Merrit	<b>6/29</b> <sup>u</sup>	11.3	350.0	64.9	46.6
LC760209C	7/1	11.5 <sup>a</sup>	298.0	x	56.4 <sup>a</sup>
LC99602075L	7/2	11.4 <sup>a</sup>	251.4	56.4	56.8 <sup>a</sup>
Pennell	7/4	10.9	116.1	54.8	<b>57.5</b> <sup>a</sup>
LC00600854E	7/1	10.1	63.7	x	32.5
LC9960273L	7/5	<b>12.2</b> <sup>a</sup>	60.3	x	54.6 <sup>a</sup>
LC860359L	7/5	10.8	37.2	x	50.7
Means ( <i>n</i> = 48)	7/1	10.4	281.1	61.8	42.3
LSD (0.05 by t)		0.8	82.9		3.7
CV% ( <i>s</i> /mean)		5.51	20.49		6.10
F-Value		14.15	34.72		93.43

<sup>a</sup> - Denotes values equal highest value (in **bold**) based on LSD<sub>(0.05)</sub>.

<sup>u</sup> - Denotes unreplicated, not analyzed data

x - Denotes not enough sample was available for analysis.