

<u>PROJECT TITLE:</u>	Statewide evaluation of dry pea variety performance (Montana Statewide Dry Pea Performance Trial).
<u>EXPERIMENT NO:</u>	#8007
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(This Report Summarizes the Moccasin Testing Site Only)

OBJECTIVES:

To evaluate the performance of dry pea varieties under different climatic and cropping conditions across Montana.

METHODS:

The 2002 Montana Statewide Dry Pea Performance Trial (SPPT) included 10 dry pea varieties, established at four dryland sites (Sidney, Moccasin, Huntley, and Conrad) and one irrigation site (Conrad). Entries ranged in color, seed size, vine length, and leaf type (**Table 1**). The trial was seeded on April 15th, into re-cropped barley stubble (**Table 2**). Grain harvest occurred at the end of July through the first of August. Other important production methods are summarized in **Table 2**.

RESULTS:

Drought-like conditions persisted into the 2002 cropping year across much of Montana. At the Moccasin site, crop-year precipitation (April through July) was 86% of normal, receiving 1.14 inches below the normal growing season precipitation.

Dry Pea Grain Yields: Despite the shortage of precipitation, the dry pea grain production at Moccasin averaged 2,076 pounds per acre (34.6 bu/acre; **Table 3**). CDC Mozart smooth yellow pea was the highest grain producer, averaging 2,545 pounds per acre (42.42 bu/acre). Eclipse (formerly CEB 1475), CDC Handel, and Swing, all smooth yellow dry peas, had statistically similar (at 5% level) yields.

Kernel Weights: One thousand kernel weights at Moccasin ranged from 128 grams up to 272 grams for Trapper yellow and Toledo green peas, respectively (**Table 3**). Dry pea test weights ranged from 60.3 pounds up to 63.9 pounds per bushel, averaging 62.9 pounds per bushel (**Table 3**). Dry pea test weights were highest at the Moccasin test site.

Plant Heights: Plot canopy heights were measured at physiological and grain maturity growth stages. Toledo smooth green dry pea was the tallest (not significantly taller at $p \leq 0.05$) variety at both growth stages (**Table 3**), with Swing yellow and Majoret green peas having consistently similar canopy heights. Per usual for long-vine, forage type peas, Granger Austrian winter pea and Trapper yellow pea had the longest vine lengths and the lowest standability index (**Table 3**).

Growth Stage Dates: Swing yellow pea, was the earliest variety to reach physiological and grain maturity (**Table 4**). Pod formation occurred 5 days past flowering. On average, it took 11 days from flowering (6 days from pod formation), for pods to begin filling with peas. Physiological maturity occurred nine days

later (3 weeks from first flower) and from physiological maturity, nine days were required for the peas to dry down and reach grain maturity (29 days from flowering).

SPPT Multi-Year (1998-2001) Summary: Dry pea grain yields for selected varieties that have been included in the Statewide Dry Pea Performance Trial at Moccasin for three (3) or more of the five years (1998 - 2002) the trials have been conducted, were summarized (**Table 5**). Dry pea grain production of these selected varieties has averaged 1,666 pounds per acre (27.8 bu/acre) and has increased since 1998. With an average dry pea production of 1,967 pounds per acre, Grande, smooth yellow pea, has been the best grain producer, but has not had significantly ($p \leq 0.05$) higher production than CDC Handel, CDC Mozart and Swing smooth yellow peas. Compared with Trapper yellow field pea (a forage type), all varieties tested, with the exception of the Austrian winter pea Granger, have consistently out-yielded Trapper.

FUTURE RESEARCH:

Variety trials may continue on a statewide basis to evaluate dry pea varieties for adaptation in different Montana climates and to provide a more comprehensive statewide dry pea database, if need demands it.

Table 1. 2002 Montana Statewide Dry Pea Performance Trial - Dry pea variety characteristics summary.
- Exp. 800002. Central Ag. Research Center, Moccasin, MT. **{File: 800702:Character}**

Variety	Seed Source	Pea Type	Useage	Seed Size ^{2/}	Vine Length	Leaf Type
CDC Handel	CDC-UofSask.	Smooth Yellow	Food/Feed	Medium	Semi-dwarf	Semi-leafless
CDC Mozart	CDC-UofSask.	Smooth Yellow	Food/Feed	Medium	Semi-dwarf	Semi-leafless
Eclipse ^{1/}	Cebeco-Zaden	Smooth Yellow	Food/Feed	Very Large	Semi-dwarf	Semi-leafless
Swing	Cebeco-Zaden	Smooth Yellow	Food/Feed	Medium	Semi-dwarf	Semi-leafless
Trapper	Public	Smooth Yellow	Feed/Forage	Small	Tall	Normal
Cruiser	Legume Logic	Smooth Green	Food/Feed	Medium	Semi-dwarf	Semi-leafless
Espace	Cebeco-Zaden	Smooth Green	Food/Feed	Medium	Semi-dwarf	Semi-leafless
Majoret	Legume Logic	Smooth Green	Food/Feed	Medium	Semi-dwarf	Semi-leafless
Toledo	Cebeco-Zaden	Smooth Green	Food/Feed	Very Large	Semi-dwarf	Semi-leafless
Granger	Public	Austrian winter	Forage	Small	Tall	Semi-leafless

^{1/} - Eclipse was CEB 1475 in previous trials.

^{2/} - Seed Size Ranges (g/1000 seeds) :
 Very Large = >290-295
 Large = 250-290
 Medium = 190-250
 Small = <190

Table 2. Statewide Dry Pea Performance Trial - Moccasin trial management summary.
 - Exp. 800702. Central Agricultural Research Center, Moccasin, MT. **{File: 800702:Manage}**

Field Summary			
Environment:	Dryland		
Tillage History:	No-Till	Previous Crop:	Barley
Trial Management			
Seeding Date:	4/15	Plot Dimensions: 5-rows x 11" spacing x 16'	
Fertilizer: (lbs/ac)	None		
Pesticides:(rates)	Sonalan (8 bs/acre) - Pre-Plant Incorporated (10/14/01) Assure II (10 oz/ac) - Post Emergence (5/29/02)		
Harvest Dates:	7/30-8/6	Timing: At grain maturity -Using a 5' plot harvester	
Precipitation:	7.12"	- Crop-year (4/15 - 7/20 {Phys. Maturity})	
Elevation:	4300'		

Table 3. 2002 Statewide Pea Performance Trial - Moccasin grain yield and agronomy summary.
 - Exp. 800702. Central Ag. Research Center, Moccasin, MT **{File: 800702:Statewide}**

Variety	Dry Pea Grain Summary			Plot Canopy Heights		Vine Length	Stand Index ^{2/}	
	Yield (lbs/a)	Size (g/1000)	Weight (lbs/bu)	Moisture (%)	Phys. ^{1/} (inches)			Mature
CDC Mozart	2,545 ^a	224.9	63.5 ^a	14.7 ^a	14.4	14.8	16.4	0.903 ^a
Eclipse	2,468 ^a	243.0	63.9 ^a	14.8 ^a	16.1	15.9	17.9	0.887 ^a
CDC Handel	2,306 ^a	198.0	63.2	15.0 ^a	17.0 ^a	16.0	19.8	0.810
Swing	2,212 ^a	240.5	62.5	14.2	17.3 ^a	17.3 ^a	19.4	0.892 ^a
Cruiser	2,017	214.4	61.6	14.2	16.0	16.6 ^a	18.4	0.904 ^a
Espace	1,974	221.9	63.8 ^a	14.9 ^a	16.4	17.4 ^a	18.4	0.947 ^a
Majoret	1,921	244.6	63.4 ^a	14.6 ^a	17.1 ^a	17.3 ^a	19.0	0.908 ^a
Granger	1,849	142.9	63.6 ^a	14.0	16.8 ^a	11.8	34.5 ^a	0.346
Toledo	1,816	272.1 ^a	60.3	14.2	17.8 ^a	17.9 ^a	20.3	0.885 ^a
Trapper	1,651	127.6	63.0	13.9	11.8	9.5	33.5 ^a	0.285
Means (<i>n</i> = 40)	2,076	213.0	62.9	14.4	16.1	15.4	21.7	0.777
LSD (0.05 by t)	424	7.5	0.6	0.7	1.3	1.5	2.3	0.074
C.V. % (s / means)	14.1	2.4	0.7	3.4	5.4	6.8	7.1	6.5
F-Value (9,27 df)	4.08 ^{**}	313.0 ^{**}	29.9 ^{**}	2.68 ^{**}	16.9 ^{**}	27.3 ^{**}	71.3 ^{**}	93.5 ^{**}

^{**} - Indicates statistical significance at 0.05 level.

^{1/} - Plot canopy height at physiological maturity.

^{2/} - Stand Index (standability) measured as ratio of grain mature height (ht_{mat}) to vine length (ln_{vine}).

Table 4. Statewide Dry Pea Performance Trial - Summary of plant growth stages at Moccasin.
- Exp. 800702. Central Agricultural Research Center, Moccasin, MT. **{File: 800702:Stages}**

Variety	Flower	Pod Form		Pod Fill		Physiological Mat.		Grain Maturity	
	days from: ---- (seeding)	----	flower	seeding	pod form	seeding	pod fill	seeding	phys. mat.
CDC Handel	75	81	6	87	6	92 ^a	5	102	10
CDC Mozart	74	80	6	86	6	94	8	103	9
Cruiser	74	79	5	85	6	94	9	101	8
Eclipse	75	81	6	87	6	92 ^a	5	102	10
Espace	74	79	5	86	7	95	9	104	9
Granger	79	85	6	88	3	102	14	113	10
Majoret	74	78	4	85	7	97	12	106	9
Swing	74	78	4	85	7	91^a	6	100^a	9
Toledo	73	78	5	85	7	95	10	103	8
Trapper	76	81	5	86	5	97	11	107	11
Means	75	80	5	86	6	95	9	104	9
LSD (0.05 by t)						1		1	
C.V.% (s/mean)						1.04		0.58	
F-value (9,27 df)						43.2 ^{**}		111.4 ^{**}	

** - Indicates statistical significance at 0.05 level.

a - Denotes value equal to lowest value (in **bold**) based on LSD_(0.05).

Table 5. Statewide Dry Pea Trial - Multi-year (1998-2002) dry pea grain yield summary at Moccasin.^{1/}
- Exp. 800002. Central Agricultural Research Center, Moccasin, MT. **{File: 800702:Multi-Year}**

Variety	Pea Type	Year					Average Yield ^{3/}	% of Trapper
		1998	1999	2000	2001	2002		
----- (lbs/acre) -----								
Grande	Smooth Yellow	1,778	1,863	1,685			1,967^a	162%^a
CDC Handel ^{2/}	Smooth Yellow		1,763		2,232	2,306	1,904 ^a	147% ^a
CDC Mozart ^{2/}	Smooth Yellow		1,532		2,122	2,545	1,894 ^a	145% ^a
Swing	Smooth Yellow			2,030	1,775	2,212	1,813 ^a	140%
Eclipse	Smooth Yellow		1,451	1,516	1,865	2,468	1,743	131%
Toledo	Smooth Green		1,284	1,838	1,850	1,816	1,615	126%
Majoret	Smooth Green		1,337	1,497	1,792	1,921	1,554	122%
Espace	Smooth Green		1,154	1,600	1,698	1,974	1,524	119%
Granger	Austrain winter	950	1,027		1,600	1,849	1,358	104%
Trapper	Smooth Yellow	889	1,193	1,365	1,329	1,651	1,285	100%
Means (n=50)		1,206	1,400	1,647	1,796	2,082	1,666	130%
LSD (0.05 by t)							221	18%
C.V.% (s / means)							10.16	11.45
F-Value (9,23 df)							9.73 ^{**}	10.21 ^{**}
Trial Means		1,533	1,315	1,668	1,701	2,076	1,659	

** - Indicates statistical significance at 0.05 level.

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

^{1/} - Summary includes those varieties involved in 3 or more years of testing only.

^{2/} - CDC Handel and CDC Mozart 2001 yields were from a separate trial, adjacent to Statewide trial.

^{3/} - Averages are estimates, which account for missing years' data.