

PROJECT TITLE: Evaluation of Fall-Seeded Winter Pea and Lentil Cultivars

EXPERIMENT NO.: #820703

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OBJECTIVES:

To evaluate winter survival, performance, and yield of winter pea and lentil variety/breeding lines for grain and forage production potentials in Central Montana's dryland environment.

METHODS:

Nine winter pea and winter lentil varieties/breeding lines were seeded at the Central Agricultural Research Center (CARC) at Moccasin on October 16, 2002. Information for the test lines is listed on Table 1. Plot dimensions and management practices are shown in Table 2. Plant stands were counted in the fall and spring. Biomass samples were collected approximately a week prior to grain maturity and harvest. Grain was harvested by a plot combine at grain maturity during the period between July 28 and July 31.

Table 1. 2003 Winter Pea and Lentil Evaluation Trial - Dry pea and lentil characteristics.
-Exp. 82-840703. Central Agricultural Research Center, Moccasin, MT. **{File- 820703:Character}**

Peas	Type	Vine Length	Leaf-Type	Seed Size ^{1/}	Maturity
Granger	Austrian	Long	Afilia	155	Late
011	Smooth Yellow	Semi-Dwarf	Afilia	140	Late
424	Smooth Yellow	Semi-Dwarf	Normal	140	Late
531	Smooth Yellow	Semi-Dwarf	Normal	140	Late
544	Smooth Yellow	Long	Normal	140	Late
PS9430706	Smooth Yellow	Long	Afilia	145	Late
PS9530645	Smooth Yellow	Semi-Dwarf	Afilia	150	Late
PS9530726	Smooth Green	Semi-Dwarf	Normal	160	Late
PS9830S431	Smooth Yellow	Semi-Dwarf	Afilia	130	Late
Lentils	Type	Cotyledon Color	Seed Color	Seed Size	Maturity
Toni	Small Red	Red	Brown	30	Very Late
WA8649090	Small Green	Yellow	Green	30	Medium
WA8649041	Small Red	Red	Brown	30	Very Late
LC9977116	Small Green	Yellow	Green	35	Medium
LC9977019	Small Green	Yellow	Green	45	Medium
LC9979016	Small Red	Red	Brown	30	Late
LC9440070	Medium Red	Red	Green	55	Late
LC9976079	Small Red	Red	Brown	35	Late
LC9979010	Small Red	Red	Green	30	Late

^{1/} - Seed sizes were similar among cultivars, values are average seed size at planting.

Table 2. 2003 Winter Pea and Lentil Evaluation Trial - Site management summary.

- Exp. 82-840703. Central Agricultural Research Center, Moccasin, MT.

{File: 820703:Manage}

Field Summary			
Environment:	Dryland		
Tillage History:	Conventional	Previous Crop:	Winter Wheat
Trial Management			
Seeding Date:	10/16	Plot Dimensions:	5-rows x 11" spacing x 30'
Fertilizer: (lbs/ac)	None		
Pesticides:(rates)	Assure II	(10oz/acre)	Hand Weeded
Harvest Dates:			
Forage:	6/20	Hand harvested - 1.0 m x 5 rows	
Biomass:	1 week prior to harvest	Hand harvested - 1.0 m x 3 rows	
Grain Harvest:	7/28 - 31	Timing: At grain maturity	
Precipitation:	10.16"	- Crop-year (11/01 - 7/31)	
Elevation:	4300'	- 93-year Average: 11.48"	

RESULTS:

Table 3 and Table 4 show winter survival, biomass and seed yield of each variety/breeding line of pea and lentil, respectively. Due to the dry summer in 2003, the yields of pea and lentil were generally low and little difference among the breeding lines of peas. Several lentil breeding lines performed superior than others (Table 4).

Table 3. 2002 Winter Pea and Lentil Evaluation - Winter survival, grain and biomass yield summary.

-Exp. 82-840702. Central Agricultural Research Center, Moccasin, MT

{File- 820702:Sum}

Selection		Winter	Forage		Grain		Seed	Test	Harvest
		Survival	Canopy	Yield	Canopy	Yield	Size	Weight	Index
		(%)	(cm)	(lba/a)	(cm)	(lbs/a)	(g/1000)	(lbs/bu)	(grain/biomass)
424	yellow	98.6 ^a	59.0 ^a	2,551 ^a	57.8 ^a	1,473 ^a	116.1 ^a	63.0 ^a	0.368 ^a
544	yellow	108.6 ^a	63.3 ^a	2,504 ^a	58.8 ^a	1,446 ^a	115.8 ^a	62.8	0.375 ^a
431	yellow	100.3 ^a	48.0	2,375 ^a	51.3 ^a	1,510 ^a	106.4 ^a	63.0 ^a	0.425 ^a
Granger	AWP	97.0 ^a	61.5 ^a	2,304 ^a	58.8 ^a	1,447 ^a	119.7 ^a	64.3 ^a	0.373 ^a
726	green	105.0 ^a	42.3	2,277 ^a	33.5 ^a	1,488 ^a	115.4 ^a	63.5 ^a	0.383 ^a
531	yellow	101.2 ^a	52.5	2,212 ^a	55.8 ^a	1,408 ^a	113.8 ^a	62.9 ^a	0.370 ^a
706	yellow	102.5 ^a	54.8	2,083 ^a	58.8 ^a	1,199 ^a	115.9 ^a	63.5 ^a	0.343
011	yellow	99.9 ^a	44.3	2,059 ^a	48.8 ^a	1,793 ^a	127.9 ^a	64.1 ^a	0.460 ^a
645	yellow	99.4 ^a	40.0	1,959	46.0 ^a	1,201 ^a	100.8 ^a	63.8 ^a	0.383 ^a
Means		101.4	51.72	2,258	52.1	1,441	114.6	63.4	0.386
LSD (0.05 by t)		7.4	4.985	497	7.4	226	7.3	0.6	0.032
CV% (s/means)		5.0	6.604	15.08	9.7	10.76	4.3	0.6449	5.6

^a - Denotes values equal to highest value (in **bold**), based on LSD_{0.05}.ⁿ - Denotes values not significantly larger than other values, based on LSD_{0.05}.

ns - Denotes no statistical significance at 0.05 level.

Table 2002 Winter Pea and Lentil Evaluation - Winter survival, grain and biomass yield summary.
 -Exp. 82-840702. Central Agricultural Research Center, Moccasin, MT {File- 840702:Sum}

Selection		Forage		Grain		Size	Test Wt	Moisture
		Canopy	Biomass	Canopy	Yield			
		(cm)	(lbs/a)	(cm)	(lbs/a)	(g/1000)	(lbs/bu)	(%)
Toni	Red	26.2 ^a	1,444	35.5^a	1,233	25.0	64.4	8.7 ^a
WA090	Green	23.5	1,115	26.3	1,498^a	25.7	64.8	8.8 ^a
WA041	Red	27.3^a	1,395	35.0 ^a	1,096	25.4	64.9	8.4
116	Green	26.3 ^a	1,189	25.5	1,419 ^a	32.1	64.7	8.8 ^a
019	Green	27.0 ^a	1,309	31.8	1,109	44.1 ^a	63.4	8.4
016	Red	27.3^a	1,142	33.0	1,214	27.8	64.7	8.5
070	Red	24.0	1,150	31.0	810	51.6^a	60.3	8.3
079	Red	26.0 ^a	1,311	32.0	1,175	31.0	64.4	8.8 ^a
010	Red	25.0 ^a	1,459ⁿ	28.8	1,374 ^a	28.3	65.2ⁿ	8.6 ^a
Means		25.8	2,740	31.0	1,214	35.4	28.3	8.6
LSD (0.05 by t)		2.6	ns	2.3	198	9.6	ns	0.3
CV% (s/means)		6.8	13.13	5.1	11.1	18.58	8.0	2.2

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

ⁿ - Denotes values not significantly larger than other values, based on LSD_{0.05}.

ns - Denotes no statistical significance at 0.05 level.

FUTURE PLANS: Winter pea and lentil variety evaluation will be continued to identify adaptable cultivars for central Montana growers.