PROJECT TITLE: Evaluation of winter pea and winter lentil lines for adaptation to central Montana conditions.
green manure.

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OBJECTIVES:

To evaluate new and existing winter pea and winter lentil lines and varieties in continuous crop systems. Points to be evaluated are winter survival, seed yield, and production of foliage for green manure/forage.

RESULTS:
The target seeding rate was eight (8) plants per square foot for the winter peas and 12 plants per square foot for the winter lentils. The nurseries were seeded no-till into chemical fallow in late September, which was two weeks later than planned due to delay in obtaining the seed. Seedlings were counted in the fall and in the spring to determine survival rate. Counts were made on the same segment of the plot.

The 2001 winter pea survival was relatively good due to the mild winter conditions. Some pea entries showed an increase in spring plant numbers compared to fall plant numbers (Tables 1 & 2). Several entries had more plants in the spring count than in the fall. This fact indicates there were some seedlings that did not emerge in the fall of 2000. Each entry was compared winter survival percent was compared to that of the check variety Melrose.

The 2001 winter lentil survival was relatively good due to the mild winter conditions, but the winter lentils did not survive as well as the winter peas (Table 3). None of the lentils showed a increase in spring plant numbers compared to fall stand counts. Winter survival percents are compared to Toni the on winter lentil released by Montana State University.

This nursery was inadvertently destroyed when a tank mix of Assure II + Roundup was sprayed on it when it was supposed to be Assure II alone (by a none CARC employee!). Survival after the Roundup treatment was fair – good but it did ruin any chance of yield comparisons.

SUMMARY:
Winter peas and winter lentils continue to show promise as a fall seeded crop when seeded into undisturbed stubble.

FUTURE PLANS:
MAES will continue to evaluate line and varieties of winter peas and winter lentils in uniform trials. Winter pulse populations will be screened for winter survival in hopes of identifying populations and single plants with superior winter hardiness.

Table 1. 2001 Winter Pea Selection Evaluation - Winter survival of winter pea lines from USDA-ARS. - Exp. 820701. Central Agricultural Research Center, Moccasin, Montana. **{File: 820701- WntrPea}**

Selection	Pea Type	--- Fall Counts --- Plants (plants/ft^2)	Stand (%)	--- Spring Counts --- Plants (plants/ft^2)	Stand (%)	Winter Survival (%)	Survival Comparison (% of Melrose)
Melrose	Austrian winter	6.3	79.3	6.7	83.8	**107.5** [a]	**100.0**
PS9430706	Winter Yellow	7.6	95.1	6.2	77.0	79.9 [a]	76.6
PS9530645	Winter Yellow	6.7	83.8	4.0	49.8	56.2	55.7 [b]
PS9530726	Winter Green	**9.1** [ns]	**113.2** [ns]	**7.8** [ns]	**97.4** [ns]	86.7 [a]	82.1
PS9630427	Winter Yellow	6.7	83.8	6.7	83.8	100.2 [a]	93.8
PS9630437	Winter Yellow	6.7	83.8	6.9	86.1	103.9 [a]	97.5
Means (n = 24)		7.2	89.8	6.4	79.6	89.0	84.28
LSD (0.05 by t)		4.6	57.7	4.9	60.6	49.0	38.64
C.V. % (s / means)		24.98	24.97	29.63	29.60	21.40	17.84
F-Value (df = 5)		0.63 [ns]	0.63 [ns]	0.92 [ns]	0.93 [ns]	2.04 [ns]	2.47 [ns]

[ns] - Indicates no statistical significance at 0.10 level.
[a] - Denotes values equal to highest value (in **bold**) based on $LSD_{(0.05)}$.
[b] - Denotes values significantly different than Melrose (in **bold**) based on $LSD_{(0.05)}$.
[1/] - Stand as percent of target seeding rate - 8 plants/ft^2.

Table 2. 2001 Winter Pea Selection Evaluation - Winter survival evaluation summary. - Exp. 820701. Central Agricultural Research Center, Moccasin, Montana. **{File: 820701- AllPea}**

Selection	Pea Type	--- Fall Counts --- Plants (plants/ft^2)	Stand [1/] (%)	--- Spring Counts --- Plants (plants/ft^2)	Stand [1/] (%)	Winter Survival (%)	Survival Comparison (% of Melrose)
World Population	Austrian winter	5.7	70.5	5.5	68.2	97.4 [a]	91.5
Melrose	Austrian winter	6.4 [a]	79.6 [a]	6.7	84.1	107.5 [a]	**100.0**
PS9430706	Winter Yellow	7.7 [a]	95.5 [a]	6.2	77.3	79.9	76.6
PS9530645	Winter Yellow	6.7 [a]	84.1 [a]	4.0	50.0	56.1	55.6 [b]
PS9530726	Winter Green	9.1 [a]	113.7 [a]	7.8 [a]	97.7 [a]	86.7	82.1
PS9630427	Winter Yellow	6.7 [a]	84.1 [a]	6.7	84.1	100.1 [a]	93.9
PS9630437	Winter Yellow	6.7 [a]	84.1 [a]	6.9	86.4	103.8 [a]	97.5
MT98EB01	Austrian winter	5.8	72.8	5.3	65.9	93.3 [a]	86.4
MT98EB02	Austrian winter	6.9 [a]	86.4 [a]	7.3 [a]	90.9 [a]	105.0 [a]	98.5
MT98EB03	Austrian winter	8.6 [a]	106.8 [a]	9.7 [a]	120.5 [a]	113.6 [a]	105.7
MT98EB06	Austrian winter	5.8	72.7	6.6	81.8	111.1 [a]	103.6
MT98EB12	Austrian winter	5.7	70.5	6.5	81.8	**126.8** [a]	115.6
MT98EB18	Austrian winter	7.1 [a]	88.7 [a]	7.5 [a]	93.2 [a]	109.1 [a]	101.9
MT98EB35	Austrian winter	5.9	72.8	6.4	79.6	109.2 [a]	103.3
MT98EB39	Austrian winter	8.0 [a]	100.0 [a]	8.2 [a]	102.3 [a]	102.3 [a]	96.7
MT98EB48	Austrian winter	**9.8** [a]	**122.8** [a]	**10.6** [a]	**131.8** [a]	108.4 [a]	101.6
MT98EB73	Austrian winter	8.2 [a]	102.3 [a]	8.2 [a]	102.3 [a]	100.9 [a]	94.7
Means (n = 68)		7.1	88.6	7.0	88.1	100.7	94.4
LSD (0.05 by t)		3.5	43.2	3.6	44.8	38.5	32.0
C.V. % (s / means)		22.97	23.01	24.13	24.01	18.02	15.98
F-Value (df = 16)		1.22 [ns]	1.22 [ns]	1.71 [ns]	1.71 [ns]	1.49 [ns]	1.62 [ns]

[ns] - Indicates no statistical significance at 0.10 level.
[a] - Denotes values equal to highest value (in **bold**) based on $LSD_{(0.05)}$.
[b] - Denotes values significantly different from Melrose AWP (in **bold**) based on $LSD_{(0.05)}$.
[1/] - Stand as a percentage of target seeding rate - 8.0 plants/ft^2.

Table 3. 2001 Winter Lentil Selection Evaluation - Winter survival summary.
- Exp. 840701. Central Agricultural Research Center, Moccasin, Montana. **{File: 840701- WntrLent}**

Selection	Lentil Type	--- Fall Counts [1/] --- Plants (plants/ft^2)	Stand [2/] (%)	--- Spring Counts --- Plants (plants/ft^2)	Stand (%)	Winter Survival (%)	Survival Comparison (% of Toni)
Toni [3/]	Small Winter Red	10.8 [a]	89.8 [a]	5.5 [a]	54.4 [a]	59.9	**100.0**
WA8649041	Small Winter Red	10.6 [a]	88.6 [a]	7.8 [a]	76.4 [a]	**86.4** [a]	141.1
WA8649090	Small Winter Green	6.8	56.6	1.9	18.5	35.4	66.4
LC9440070	Med. Winter Green	9.4 [a]	78.0 [a]	1.4	13.3	13.8	16.2 [b]
LC9977019	Med. Winter Green	**11.0** [a]	**91.3** [a]	**6.8** [a]	**67.4** [a]	74.9 [a]	135.2
LC9977116	Med. Winter Green	8.8 [a]	73.0 [a]	2.8	27.7	38.1	62.3
LC9979016	Small Winter Green	8.7 [a]	72.1 [a]	5.2 [a]	51.7 [a]	70.1 [a]	129.1
Means (n = 28)		9.4	78.5	4.5	44.2	54.1	92.9
LSD (0.05 by t)		2.4	19.9	2.1	20.5	21.9	50.8
C.V. % (s / means)		16.11	16.12	29.47	29.45	25.70	34.71
F-Value (df = 6)		3.94 [**]	3.94 [**]	14.23 [**]	14.24 [**]	13.79 [**]	8.33 [**]

[**] - Indicates statistical significance at 0.05 level.
[a] - Denotes values equal to highest value (in **bold**) based on $LSD_{(0.05)}$.
[b] - Denotes values equal to Toni winter lentil (in **bold**) based on $LSD_{(0.05)}$.
[1/] - Fall counts performed same time as Spring counts (April 26th & 27th) - Fall growth determined as visible frost damage (brown or dead) of plant tissue; spring growth determined as green growth.
[2/] - Stand as percent of target seeding rate - 12.0 plants/ft^2.