2010 Montana Statewide Spring Pulse Variety Evaluations

Montana State University
Montana Agricultural Experiment Stations

For More information, visit our Annual Reports section at:
http://ag.montana.edu/carc/

2010 Statewide Spring Pulse Variety Evaluations

Experiments #: 80, 85 & 89

K.E. Neill, Research Associate-Agronomy & C. Chen, Assoc. Prof. Cropping Systems
MSU-MAES, CARC, Moccasin, MT

OBJECTIVES: The objectives of these trials were to evaluate spring dry pea, lentil, and chickpea commercial varieties and experimental lines for grain production potential in the diverse Montana environments.

METHODS: Three trials were established to evaluate spring dry pea, lentil and chickpeas varieties. The trials were conducted at the seven Montana State University - Montana Agricultural Experiment Stations (MSU-MAES) Agricultural Research Centers across Montana and in cooperating producers' fields near Amsterdam, Richland and Joplin, Montana (**Table 1**).

The spring dry pea evaluation trials consisted of the 2010 Statewide Spring Dry Pea Trial at ten locations, private pea entries (both commercial and experimental) at five locations (Conrad, Havre, Moccasin, Richland and Sidney) and the 2010 Western Regional Trial (from the USDA-ARS Grain Legume Genetics and Physiology Program) at two locations (Moccasin and Richland). The 2010 Statewide Dry Pea Evaluations consisted of 13 varieties, of which, five are commercially available smooth green, five are commercially available smooth yellow and three are experimental smooth yellow dry pea lines from the USDA-ARS Grain Legume Genetics and Physiology program at Pullman, Washington (**Table 2**). Characteristics of the additional varieties evaluated across Montana are also listed in **Table 2**.

The spring lentil evaluation trial consisted of the 2010 Statewide Lentil Variety Evaluation at ten locations and the 2010 Western Regional Lentil Trial at two locations (Moccasin and Richland). The 2010 Statewide Lentil Variety Evaluations contained 13 lentil varieties, of which, four are commercially available medium green varieties, two are commercially available small red varieties, three are commercially available large green varieties, and four are experimental lines from the USDA-ARS program **(Table 3a).**

The chickpea evaluations consisted of the 2010 Western Regional Chickpea Trial (from the USDA-ARS Grain Legume Genetics and Physiology Program) and experimental lines selected from Australian and Indian pulse breeding programs (**Table 3b**), primarily seeded at Moccasin and Richland. However, a selected subset of cultivars was evaluated at Havre.

The trials were organized and packaged at CARC in Moccasin, then shipped to each individual testing site. All seed in the trial was pre-treated with fludioxinil and mefenoxam fungicides (Apron MAXX® RTU, Syngenta Crop Protection, Inc) to protect against soil seed and seedling diseases, with th excpetion of Moccasin, where the seed was additionally treated with thiamethoxam insecticide (CruiserMAXX®, Syngenta Crop Protection, Inc) to control a heavy pea leaf weevil infestation. All seed was properly inoculated prior to seeding. Best management practices were employed using available resources at each site. Important management information, including but not limited to, seeding date, previous crop, crop-year precipitation, etc., are presented in **Table 1**.

RESULTS: **Note**: The following results and summary are for **informational purposes only**. Inclusion of any commercial variety in this summary does not constitute a recommendation by MSU-MAES or CARC.

Dry Pea Grain Yields were respectable among most of the testing sites with the exception of the Conrad site, which received hail during the pod-fill stage resulting in suppressed yields. Consequently, extreme caution should be made in interpreting the Conrad data set (**Table 4**). Grain yields at Bozeman were also affected by hail. An attempt to estimate hail losses was taken through hand counting seed on the ground in a 0.25 m^2 area within the plot. The Corvallis site, which is an "irrigated" site, had the best grain production (3,483 lbs $acre^{-1}$). The trial was abandoned at the Creston site due to sever deer predation. Of the dry-land locations, Havre had the greatest production, with a trial average of over 55 bushels $acre^{-1}$ (3,397 lbs $acre^{-1}$; **Table 4**).

The smooth yellow varieties tended to have higher grain production across all nine locations (statistics not shown) compared with the smooth green cultivars (**Table 4**). Among the Statewide varieties, CDC Mozart yellow was either the top or statistically similar to the top trial yielding entry at seven of the nine locations (**Table 4**). CDC Centennial and Line PS04100710 yellow peas showed good grain potential, being among the top cultivars in the five and two locations, respectively, they were tested. Of the Statewide green varieties, Majoret and Stirling green peas were consistently the top grain

producing varieties (**Table 4**), however, CDC Patrick and Line PS06100760 were among the top grain producers at the sites they were tested.

Plant Heights differed from location to location with the Huntley site having the highest trial mean (32.4", **Table 5**). Grain mature canopy heights at Richland were adversely affected by intense winds of a severe thunderstorm that hit the area 2-days prior to grain harvest. However, the differences in heights among the cultivars may give insight to their relative lodging potential. Although selection PS9910140 showed good yield potential at four sites, being the top grain producer (not significant) at one site, the cultivar's plant canopy height at grain maturity (harvest) was among the shortest of all entries evaluated (**Table 5**). DS Admiral was the tallest yellow pea variety and was one of the tallest cultivars evaluated, being the tallest (not significant) variety at four of the six sites reporting. CDC Golden and CDC Meadow were also consistently among the tallest cultivars tested. Among the green varieties, Medora was the tallest green at five of the six sites reporting and was the tallest variety tested at two sites (not significant; **Table 5**). The USDA-ARS selections were consistently among the shortest cultivars in the trials.

Test Weights, varied from location to location and ranged from 61.2 (Joplin site) to 65.1 (Corvallis) pounds per bushel (**Table 6**) Although there were no single entry had the highest test weight at each location, CDC Striker was among the highest test weights at eight of the nine testing locations.

Thousand Kernel Weight (TKW), a measure of kernel size, was very similar from location to location, ranging from 224 to 257 grams per 1,000-kernels (**Table 7**). TKWs have not been completed at for the Moccasin and Richland sites as of this printing. Overall, the two smooth yellow lines PS01102958 and PS0010836 and CDC Striker green pea were consistently among the largest seed sizes. Montech 4152 is another cultivar which shows good seed size (data pending Moccasin and Richland results).

Flowering dates differed from site to site due to differences in seeding dates and environmental conditions observed at each site (**Table 8**). However, Stirling green pea was found to flower first among all reporting sites (significant at all locations) with the exception of Moccasin, where a the USDA-ARS line PS05100632 flowered a day before Stirling (**Table 8**). Of the yellow cultivars, CDC Mozart and Delta appeared to be consistently the earliest to flower. However, Legume Logic line LL 7020 yellow was the earliest yellow to bloom (not significant) at the only location (Moccasin) reporting its' flowering date.

Lentil Grain Yields were very inconsistent across the state and ranged from 533 (Conrad) to 2736 (Havre) lbs $acre^{-1}$ (**Table 9**). As was the case in the dry pea trial, hail damage at Conrad and Bozeman affected grain yields (yields were adjusted at Bozeman). Additionally, at Moccasin and Richland, the Western Regional Lentil Line evaluations were in conjunction with the Statewide Trials (see **Tables 14 & 15**).

The medium greens CDC Richlea and the USDA-ARS selection LC01602300R appeared to have the most consistent grain yields across the state (**Table 9**). CDC Richlea was the leading producer at three and statistically equivalent with the top yielders at five of the 10 testing sites. Likewise, line LC01602300R was the top grain producer at two and statistically equivalent to five of the 10 testing sites (**Table 9**). Trial grain yield means were similar between Bozeman, Moccasin and Sidney (1953, 1906, and 1835 lbs ac^{-1}, respectively) with CDC Richlea and the small green (Eston-type) Essex appearing to perform well at all three sites (**Table 9**). The Eston-type experimental line LC03601590E also shows promise in grain production at Moccasin and Richland (**Tables 14 & 15**). The "Zero-Tanin" lines did not yield well at either Moccasin or Richland.

Plant Heights at grain maturity varied greatly from site to site (**Table 10**). At grain maturity, canopy heights ranged from 10.6 (Corvallis) to 17.9 (Conrad) inches, with Essex being consistently one of the tallest plant heights across the state (**Table 10**).

Test Weights varied from site to site, ranging from 56.6 (Conrad) to 64.3 (Bozeman; **Table 11**). The Pardina-type USDA-ARS line LC01602245P had consistently the heaviest test weight (statistically significant, based on $LSD_{0.05}$ at Bozeman, Moccasin and Sidney).

Thousand Kernel Weight (TKW), a measure of kernel size, as expected, varied greatly within each trial site, due to the size differences in lentil classes tested (**Table 12**). Kernel sizes did not vary greatly from location to location. The large green lentil Riveland had the largest seed size at all locations (significant at two sites; **Table 11**). **Flowering** was not consistent across all sites (**Table 12**), with Brewer being consistently the earliest variety tested.

Chickpea Grain Yields were severely impacted by *Ascoshyta* blight and pre-mature desiccation at Richland. The chickpea trial was added to the dry pea and lentil trial at Richland and was seeded into a lentil field. Due to the producers' need to aerially desiccate the surrounding lentil field, the chickpeas, although not ready for termination were also desiccated. Therefore, some yield reduction was observed. Chickpea yields at Moccasin, however, were the highest in recent memory averaging nearly 1500 pounds

per acre (**Table 16**). The Indian line IS 21 desi, had the highest yield at Moccasin (not significant), while the Indian Line IS 14 small kabuli was the top producer at Havre, equaled by small kabuli lines IS 05 and IS 09 (**Table 16**).

Dry Peas and Chickpea Line Selections continued at Moccasin. Single lines were seeded in order of seed quality. During the 2010 growing season, physiological notes were taken and lines exhibiting desirable growth characteristics (i.e. height, pod-set) were selected. These lines will now be advanced to single plot trials in 2011.

SUMMARY: Statewide, grain yields of dry pea and lentil across the state, over the past three years have been very promising (**Table 17** & **Table 18**). Due to the variability of grain yields from one year to another at a testing site, variety performance evaluation is difficult. A method whereby a variety's grain yield is compared to the average grain yield of its similar type provides some insight into how a particular variety performs and may provide more pertinent information than evaluating average grain yields. This comparison was performed on grain yields over the past three years of the Statewide Variety Evaluations (**Table 17** & **Table 18**). No one single variety was found to outperform any other variety across the state, indicating that variety performance is environment driven. CDC Mozart yellow and Majoret green, although older varieties, still appear to have good dry pea grain potential in Montana. Experimental line PS9910140 also showed good potential in certain locations, however, the variety's grain ripe canopy height is sub-standard. Among the lentils, the old "standard" variety, CDC Richlea, is still one of the leading medium greens across the State. However, the experimental line LC01602300R does show good promise as a medium green competitor (**Table 18**). CDC Redberry appears to be a good red lentil in most locations across Montana. The variability seen among varieties in the different climates across the State further illustrates the need for continued variety evaluations in areas where pulse crop production may expand in the future.

FUTURE PLANS: Statewide spring dry pea and lentil variety evaluations will continue across Montana as industry funding and support continues.

TRIAL COLABORATORS: These pulse crop trials were made possible, in part, by the generosity and grant funding secured through the Northern Pulse Growers Association and the U.S.A. Dry Peas, Lentils & Chickpeas. As with any trial, many individuals were involved and need to be acknowledged for their help in the successful completion of the 2010 Variety Evaluation Trials. The following list is not inclusive, as there are others who may not be listed but were just as vital in the success of these trials:

Johnna Heser, Research Assistant III, CARC, Moccasin, MT
Kelly Arnold, Agricultural Field Technician, CARC, Moccasin, MT
Gregg Carlson, Superintendent/Associate Professor - Agronomy, NARC, Havre, MT
Peggy Lamb, Research Associate-Agronomy, NARC, Havre, MT
Grant Jackson, Professor - Agronomy, WTARC, Conrad, MT
John Miller, Research Associate-Agronomy, WTARC, Conrad, MT
Heather Mason, Assistant Professor - Agonomy, NWARC, Creston, MT
Louise Strange, Agricultural Research Specialist III - Agronomy, NWARC, Creston, MT
Malvern Westcott, Department Head-ret./Superintendent/Prof - Agronomy, WARC, Corvallis, MT
Marty Knox, Agricultural Research Specialist III, WARC, Corvallis, MT
Joyce Eckhoff, Associate Professor - Agronomy, EARC, Sidney, MT
Ken Kephart, Department Head/Superintendent/Associate Prof – Agronomy, SARC, Huntley, MT
Geraldine (Gigi) Opena, Research Associate – Agronomy, SARC, Huntley, MT
Perry Miller, Professor - Cropping Systems, MSU-Bozeman, Bozeman, MT
Jeff Holmes, Research Associate, MSU-Bozeman, Bozeman, MT
Dick Roland, Legume Logic, Crosby, ND
Kurt Braunwart and Mike Woods, ProGene Plant Research, Othello, WA
Tanya Deforest, Alternative Seeds Strageties, Tisdale, Sask, Canada
Jay Hould, Steve Grove, et al, Montech Seed Group, Shelby, MT
Shaan Tsai, Meridian Seeds, Winnipeg, Mant, Canada
Kevin McPhee, Pulse Breeder, NDSU, Fargo, ND
George Vandemark Rebecca McGee, Pulse Breeders, USDA-ARS, Pullman, WA
Richard (Dick) Fulton, Producer, Richland, MT
Rob and Stephen Moog, Producer, Joplin, MT
John Schutter, Jr., Producer, Amsterdam, MT

Table 1. 2010 Statewide Spring Pulse Variety Evaluations - Site management summary.
-Exp. 80 & 85. Montana State University - Montana Ag. Experiment Stations, Central Ag. Research Center, Moccasin, MT

Field Summary	**Conrad**	**Moccasin**	**Havre**	**Sidney**	**Richland[1/]**	**Huntley**	**Bozeman[2/]**	**Corvallis**	**Creston[4/]**	**Joplin[3/]**
Environment:	Dryland	Dryland	Dryland	Dryland	Dryland	Dryland	Dryland	Irrigated	Dryland	Dryland
Tillage History:	Conv-Till	No-Till	No-Till	Cov-Till	No-Till	No-Till	No-Till	Conv-Till	Conv-Till	No-Till
Previous Crop:	Fallow	Barley	Camelina	Fallow	Spr Wht	Fallow	Spr Wht	Buckwheat	Not Avail	Spr Wht
Soil Type:	Scobey C-L	Judith C-L	Joplin C-L	Williams C-L	Farnuf Loam	Ft Collins C-L	AmstrdmSi-L	Burnt Fork L	Creston Si-L	Unkn
Elevation:	3665'	4250'	2700'	2200'	2950'	3020'	4775'	3600'	2970'	Unkn
Trial Management										
Pea Seed Date:	04/22/10	04/09/10	04/20/10	04/22/10	04/21/10	03/27/10	04/20/10	04/28/10	Not Avail	04/06/10
Lentil Seed Date:	04/13/10	"	"	"						
Fertilizer:	4-20-10	None	None	None	None	50lbsN	None	11-52-40	None	None
Plot Size:	125 ft^2	90 ft^2	88 ft^2	50 ft^2	50 ft^2	140 ft^2	120 ft^2	80 ft^2	60 ft^2	80 ft^2
Pesticides: (rates)		sulfentrazone (5oz ac^{-1}) pendimethalin (2 pt ac^{-1}) quizalofop (10oz/acre)	glyphosate (16oz ac^{-1}) Hand-Weed	ethalfluralin (2 pt ac^{-1})	ethalfluarlin (2pt ac^{-1}) [Farmer applied]	pendimethalin (24oz ac^{-1}) {3.3 EC form} glyphosate (16oz ac^{-1})	clethodim (8oz ac^{-1})	pendimethalin (3 pt ac^{-1})	Not Avail	none
Harvest Date:	08/20/10	8/6-9/10	8/4 -9/10	08/13/10	8/4-12/10	7/29-8/16/10	08/25/10	8/17 & 27/10	Not Avail	08/18/10
Crop-Yr Precip:	11.56"	8.54"	7.17"	15.32"	11.26"	8.74"	9.95"	7.31"	Not Avail	8.04"
	4/1 - 8/31	4/1 - 7/31	4/20-8/4&9	4/1 - 8/31	4/1 - 8/31	3/27 - 7/29	4/1-7/31	grow season		4/1 - 7/31
Site Ave:	7.05"	8.80"		9.48"	8.71"	[9.52" - Lent]	8.44" {Post Farm}			5.90"
Observations:	Hail affect Yields	Timely Precipitation		Cool Wet Summer	Some Shatter		Some hail - shattering	+ 5.25" Irr		Hail/Kochia Lower Yield

[1/] - Richland site was on an on-farm site 7-miles south of Richland, Valley County, Montana

[2/] - Bozeman site is an on-farm site west of Bozeman, near Amsterdam, Gallatin County, Montana.

[3/] - An on-farm site near Joplin, Liberty County, Montana

[4/] - Production information was not available at time of write-up

Table 2. 2010 Private Treaty Dry Pea Evaluations - Variety characteristics table.
- Exp: 80PV. Montana State University - Montana Ag. Experiment Stations, Central Ag. Research Center, Moccasin, MT

Variety	Sponsor	Size[1/]	Maturity[2/]	Height[2/]	Resistance/Claim	Breeding Co.	Release
Yellow Peas							
DS **Admiral**	Statewide Selections	Medium	Mod	Tall	Powdery Mildew	Danisco	2000
Delta		Medium	Mod	Mod	*Fusarium*- 1, Old Var.	Cebeco-Zaden (Limagrain)	1990-95
CDC **Golden**		Medium	Mod	Tall	Stem Strength	Crop Development Centre	2003
SW **Midas**		Medium	Mod	Mod	Stem Strength, PM	Swalöf-Weibull AB	2004
CDC **Mozart**		Medium	Mod	Short	Powdery Mildew	Crop Development Centre	2002
PS9910140		Medium	Mod	Short	Not Published	USDA-ARS	NA
PS0010836		Medium	Mod	Short	Not Published	USDA-ARS	NA
PS01102958		Medium	Mod	Short	Not Published	USDA-ARS	NA
PS03101822	Statewide/USDA-ARS[3/]	Medium	Mod	Short	Not Published	USDA-ARS	NA
CDC **Centennial**	Alternative Seeds Strategies	Large	Mod	Short	Powdery Mildew, Lodging	Crop Development Centre	2007
CDC **Meadow**		Medium	Mod	Tall	Powdery Mildew, Lodging	Crop Development Centre	2008
LL 7020	Legume Logic	Medium	M. Early	Mod	Not Published	Legume Logic	NA
SW **Salute**		Large	Mod	Tall	Mod Res - PM & Ascochyta	Swalöf-Weibull AB	2000
Spider		Medium	Mod	Tall	Powdery Mildew, Lodging	Legume Logic	2008
Trapeze		Large	Mod		Lodging	Swalöf-Weibull AB	2010
AC **Agassiz**	Meridian Seeds	Medium	Mod	Mod	Res-PM; M.Suscept.-Mycrosphaerella	Agricultural and Agri-Food Canada	2007
AC **Thunderbird**		Medium	Late	Tall	Res-PM; Slight Suscept - Aschochyta	Agricultural and Agri-Food Canada	2007
LAN 4193	Montech Seed Group	Large	Mod	Mod	Not Published	Limagrain, Nederlands	NA
Montech 4152[4/]		Medium	Mod	Tall	Good height; Large Seed	Limagrain, Nederlands	2009
PRL 07-3	ProGene Plant Research	Small	Not Avail	Short	Not Published	ProGene Plant Research-Crop Food Research, NZ	NA
Pro 073-7142		Medium	Not Avail	Mod	Not Published		NA
Pro 083-7406		Medium	Not Avail	Mod	Not Published		NA
SW 734		Medium	Not Avail	Tall	Not Published		NA
SW 739		Medium	Not Avail	Tall	Not Published		NA
SW **Carousel**	USDA-ARS (Western Regional Trial) - Dr. Rebecca McGee	Medium	M. Early	Mod	PM, High Pod Set, Lodging	Swalöf-Weibull AB	2005
PS04100710		Large	Mod	Short	Not Published	USDA-ARS Grain Legume Genetics and Physiology Research	NA
PS05101240		Large	Mod	Short	Not Published		NA
PS06101043		Large	Mod	Tall	Not Published		NA
PS06101119		Large	M. Early	Short	Not Published		NA

Continued Next Page ------->

Table 2. 2010 Private Treaty Dry Pea Evaluations - Variety characteristics table (continued).

Variety	Sponsor	Size[1/]	Maturity[2/]	Height[2/]	Resistance/Claim	Breeding Co.	Release
Green Peas							
Cruiser	Statewide Selections	Medium	Mod	Mod	*Fusarium*-1, Mosaic Virus, PM, Color	Progene Plant Research-Crop Food Research, NZ	2002
Majoret		Medium	Mod	Short	None; Old Variety	Swalöf-Weibull AB	1994
Medora		Medium	M. Late	Tall	Tall, Powdery Mildew	USDA-ARS	2006
Stirling		Medium	Early	Short	Early, *Fusarium*-1, PM	USDA-ARS	2002
CDC Striker		Medium	Mod	Mod	Mod plant height	Crop Development Centre	2002
CDC Patrick	Alternative Seeds Strategies	Medium	Mod	Mod	Powdery Mildew, *Fusarium*	Crop Development Centre	2009
K2	Legume Logic	Large	Mod	Mod	Bleach	Legume Logic	2005
Cooper	Meridian Seeds	Large	Late	Mod	Powdery Mildew, Bleach	Cebeco-Zaden (Limagrain)	2003
Montech 1103	Montech Seed Group	Large	Mod	Mod	Not Published	Unknown	NA
Aragorn	ProGene Plant Research	Small	Mod	Mod	*Fusarium*-1; PSBMV	ProGene Plant Research-Crop Food Research, NZ	2006
Pro 071-6101		Medium	Not Avail	Mod	Not Published		NA
Pro 071-6102		Small	Not Avail	Mod	Not Published		NA
Pro 071-6103		Small	Not Avail	Short	Not Published		NA
Pro 071-7111		Medium	Not Avail	Mod	Not Published		NA
Pro 081-6118		Medium	Not Avail	Mod	Not Published		NA
PS03101445	USDA-ARS (Western Regional Trial) - Dr. Rebecca McGee	Large	Mod	Short	Not Published	USDA-ARS Grain Legume Genetics and Physiology Research	NA
PS04100462		Medium	M. Late	Short	Not Published		NA
PS05100120		Medium	Mod	Mod	Not Published		NA
PS05100632		Medium	Early	Mod	Not Published		NA
PS05100736		Medium	M. Late	Mod	Not Published		NA
PS05100840		Medium	M. Late	Mod	Not Published		NA
PS06100490		Medium	Mod	Mod	Not Published		NA
PS06100760		Medium	Mod	Short	Not Published		NA
Wrinkled Green Peas							
Amigo	MSU - Dr. Norm Weeden	Medium	M. Early	Short	High Amylose Content	MSU Pea Genetics Program	2009
PBL 29		Medium	M. Early	Short	High Amylose Content		NA

[1/] - Seed Size Ranges (g/1000 seeds)- {Size of seed at planting} : Very Large = >290-295 Medium = 190-250
[2/] - Compared to trial means. Large = 250-290 Small = <190
[3/] - Line was included in Statewide Trial at 3 locations, also apart of the Western Regional trials at Moccasin and Richland
[4/] - Montech 4152 has also gone by the name "Cebeco"

Table 3. 2010 Lentil and Chickpea Variety/Selection Evaluations - Variety characteristics - Exp: 85 & 89. MSU-MAES, Central Ag. Research Center, Moccasin, Montana.

a. Lentil Varieties	Size	Type	Maturity[1/]	Breeding Program	Release
Small Green	g 1000-sds^{-1}				
Eston	35-45	Green	M. Early	USDA-ARS Grain Legume	< 1990
Essex (2307E)	35-45	Green	Moderate	USDA-ARS Grain Legume	2009
LC03601590E	35-45	Green	Moderate	USDA-ARS Grain Legume	NA
LC01602273E	35-45	Green	Moderate	USDA-ARS Grain Legume	NA
Medium Green					
CDC Richlea	50-60	Green	M. Late	Crop Development Centre	1994
CDC Vantage	50-60	Green	Moderate	Crop Development Centre	1998
CDC Meteor	50-60	Green	Moderate	Crop Development Centre	2006
Brewer	50-60	Grn-Mttled	M. Early	USDA-ARS Grain Legume	1984
LC01602300R	50-60	Green	Moderate	USDA-ARS Grain Legume	NA
Large Green					
Merrit	60+	Green	Moderate	USDA-ARS Grain Legume	2003
Pennell	60+	Green	Moderate	USDA-ARS Grain Legume	2003
Riveland	70+	Green	Late	USDA-ARS Grain Legume	2007
LC06600839L	60+	Green	Moderate	USDA-ARS Grain Legume	NA
LC06601734L	60+	Green	Moderate	USDA-ARS Grain Legume	NA
LC07600517L	60+	Green	Moderate	USDA-ARS Grain Legume	NA
Small Red					
Crimson	35-45	Red	M. Early	USDA-ARS Grain Legume	1990
CDC Redberry	30-40	Red-Turkish	Moderate	Crop Development Centre	2005
LC01602062T	30-40	Red-Turkish	Moderate	USDA-ARS Grain Legume	NA
LC06601228T	30-40	Red-Turkish	Moderate	USDA-ARS Grain Legume	NA
Spanish Browns (Pardina)					
Pardina	30-40	Pardina	M. Early	USDA-ARS Grain Legume	1990
LC01602245P	30-40	Pardina	Moderate	USDA-ARS Grain Legume	NA
LC02601144P	30-40	Pardina	Moderate	USDA-ARS Grain Legume	NA
LC06600907P	30-40	Pardina	Moderate	USDA-ARS Grain Legume	NA
Zero-Tanin					
Cedar	30-40	Red	Moderate	USDA-ARS Grain Legume	2010
LC9602585RZ	30-40	Red	Moderate	USDA-ARS Grain Legume	NA
Shasta	35-45	Green	Late	USDA-ARS Grain Legume	2010
LC07600224YZ	35-45	Green	Late	USDA-ARS Grain Legume	NA

{Continued…}

Table 3. 2010 Lentil and Chickpea Variety/Selection Evaluations - Variety characteristics (continued) - Exp: 85 & 89. MSU-MAES, Central Ag. Research Center, Moccasin, Montana.

a. Chickpeas	Type	Leaf-Type	Flower	Maturity[1/]	Resistance	Breeding	Release
Dwelley	Large Kabuli	Unifoliate	White	Late	Poor	USDA-ARS	1998
Dylan	Large Kabuli	Compound	White	Moderate	Fair	USDA-ARS	2006
Sawyer	Large Kabuli	Compound	White	Moderate	Good	USDA-ARS	2009
Sierra	Large Kabuli	Compound	White	Moderate	Good	USDA-ARS	2004
CA0469C025C	Large Kabuli	Unifoliate	White	Moderate	Fair/Unkn	USDA-ARS	NA
CA049004221C	Large Kabuli	Compound	White	Moderate	Fair/Unkn	USDA-ARS	NA
CA04900843C	Large Kabuli	Compound	White	Moderate	Fair/Unkn	USDA-ARS	NA
CA04900851C	Large Kabuli	Compound	White	Late	Fair/Unkn	USDA-ARS	NA
CA0390B007C	Large Kabuli	Compound	White	Late	Fair/Unkn	USDA-ARS	NA
CA04900808C	Large Kabuli	Compound	White	Moderate	Fair/Unkn	USDA-ARS	NA
AC 45226	Small Desi	Compound	Purple	Moderate	Unkown	Australian	NA
AC 48111	Small Desi	Compound	Purple	Early	Unkown	Australian	NA
IS 02	Small Kabuli	Compound	White	Early	Unkown	Indian	NA
IS 04	Small Kabuli	Compound	White	Early	Unkown	Indian	NA
IS 05	Small Kabuli	Compound	White	Early	Fair	Indian	NA
IS 06	Small Kabuli	Compound	White	Early	Unkown	Indian	NA
IS 07	Small Kabuli	Compound	White	Early	Unkown	Indian	NA
IS 08	Med. Kabuli	Compound	White	Early	Unkown	Indian	NA
IS 09	Small Kabuli	Compound	White	Early	Poor	Indian	NA
IS 14	Small Kabuli	Compound	White	Early	Fair	Indian	NA
IS 18	Small Kabuli	Compound	White	Early	Unkown	Indian	NA
IS 21	Desi	Compound	Purple	Moderate	V. Poor	Indian	NA
IS 22	Desi	Compound	Purple	Early	Unkown	Indian	NA
IS 28	Desi-Green	Compound	Purple	Early	Unkown	Indian	NA

[1/] - Relative Maturity compared with other entries tested.
Early: 2+ Days Earlier Mod: ± 1 Day from average Late: 2+ Days Later

Table 4. 2010 Statewide/Private Treaty Dry Pea Evaluations - Dry Pea Grain Yield Summary.
-Exp: 80. MSU-MAES, Central Ag. Research Center, Moccasin, MT - **NOT FOR REPRODUCTION**

Yellow Peas	**Mocc.**	**Rich.**	**Conrad[1/]**	**Havre**	**Sidney[2/]**	**Boze[3/]**	**Huntley**	**Corvallis**	**Joplin**
	----- lbs acre^{-1} (@13% moist) -----								
DS Admiral	2642	3264 ay	1212	3325	3016	***3439*** ns	2743	2941	2236
Delta	3139 ay	3226 ay	869	3600	3105	3118	2517	3671 a	2491 a
CDC Golden	2695	2889	1154	3354	3735 ay	3132	2808	3387	1883
SW Midas	2603	2321	1212	3348	3639 ay	3436	2760	4029 a	2371 a
CDC Mozart	3020 ay	***3471*** ay	1191	3850 ay	***4025*** ay	3150	***3104*** ns	***3889*** a	2311 a
PS9910140	2862	2862	1664 ay	3490	3796 ay	3303	2600	4331 a	**2827** a
PS0010836	2914	2951 a	932	3496	3539 ay	3330	2939	2990	2549 a
PS01102958	2583	2797	1211	3492	3053	3305	2715	3478 a	2250
PS03101822	2863	2928	-----	3473	-----	-----	-----	-----	-----
CDC Centennial	3169 ay	3445 ay	***1869*** ay	***4000*** ay	3928 ay	-----	-----	-----	-----
CDC Meadow	2971 ay	2889	1309	3269	3268	-----	-----	-----	-----
LL 7020	2981 ay	3295 ay	-----	-----	-----	-----	-----	-----	-----
Salute	2983 ay	2619	-----	-----	3401	-----	-----	-----	-----
Spider	2572	2731	1100	-----	-----	-----	-----	-----	-----
Trapeze	-----	-----	-----	-----	4018 ay	-----	-----	-----	-----
LAN 4193	2923	-----	-----	3517	-----	-----	-----	-----	-----
Montech 4152	2533	-----	-----	3505	-----	-----	-----	-----	-----
Agassiz	2855	-----	-----	-----	-----	-----	-----	-----	-----
Thunderbird	2692	-----	-----	-----	-----	-----	-----	-----	-----
PRL 07-3	-----	2725	-----	-----	-----	-----	-----	-----	-----
Pro 073-7142	-----	2721	-----	-----	-----	-----	-----	-----	-----
Pro 083-7406	-----	3218 ay	-----	-----	-----	-----	-----	-----	-----
SW 734	-----	2328	-----	-----	-----	-----	-----	-----	-----
SW 739	-----	2777	-----	-----	-----	-----	-----	-----	-----
Carousel	2655	2888	-----	-----	-----	-----	-----	-----	-----
PS04100710	***3180*** ay	3159 ay	-----	-----	-----	-----	-----	-----	-----
PS05101240	2785	2707	-----	-----	-----	-----	-----	-----	-----
PS06101043	2594	2594	-----	-----	-----	-----	-----	-----	-----
PS06101119	2419	2743	-----	-----	-----	-----	-----	-----	-----
Yellow Means:	2768	2874	1248	3476	3544	3277 na	2773 na	3590 na	2365 na
$LSD_{0.05}$ (by t)	244	506	370	297	588				
C.V.% (s/means)	6.3	10.8	20.6	6.0	9.8				
Trial Analysis:									
Trial Means	**2726**	**2785**	**1224**	**3429**	**3377**	**3145**	**2719**	**3483**	**2324**
$LSD_{0.05}$ (by t)	227	528	344	303	488.3	ns	ns	495	562
C.V.% (s/means)	6.0	11.7	19.8	6.2	8.7	14.19	12	9.89	16.9

{Continued…}

DISCLAIMER

The information given herein is supplied with the understanding that no discrimination is intended and no endorsement by the Montana Agricultural Experiment Station is implied. The results of individual traits and studies are considered to be of a **preliminary** nature and should **not** be considered as a product endorsement or recommendation for commercial use.

NOT FOR PUBLICATION

Table 4. 2010 Statewide/Private Treaty Dry Pea Evaluations - Dry Pea Grain Yield Summary (Continued).
-Exp: 80. MSU-MAES, Central Ag. Research Center, Moccasin, MT - **NOT FOR REPRODUCTION**

Green Peas	**Mocc.**	**Rich.**	**Conrad[1/]**	**Havre**	**Sidney[2/]**	**Boze[3/]**	**Huntley**	**Corvallis**	**Joplin**
	----- lbs acre^{-1} (@13% moist) -----								
Cruiser	2680	2642	965	3194	2820	3041	2575	3144	2162
Majoret	2608	2981 ag	1623 ag	3451	3342 g	3008	**2945**	**3812** a	2514 a
Medora	2705	2825 g	1161	3063	2898	2749	2210	3014	1973
Stirling	2907	2567	926	3274	3052	**3288**	2874	3525 a	2630 a
CDC Striker	2428	2976 ag	1147	3222	3408 g	2585	2556	3068	2016
CDC Patrick	2722	**3202** ag	**1469** g	**3455** ns	**3377** g	-----	-----	-----	-----
K2	2436	2721 g	1304 g	-----	2751	-----	-----	-----	-----
Cooper	2797	-----	-----	-----	-----	-----	-----	-----	-----
Montech 1103	2725	-----	-----	-----	-----	-----	-----	-----	-----
Aragorn	2642	2474	945	3198	-----	-----	-----	-----	-----
Pro 071-6101	-----	2630	-----	-----	-----	-----	-----	-----	-----
Pro 071-6102	-----	2735 g	-----	-----	-----	-----	-----	-----	-----
Pro 071-6103	-----	2742 g	-----	-----	-----	-----	-----	-----	-----
Pro 071-7111	-----	3060 ag	-----	-----	-----	-----	-----	-----	-----
Pro 081-6118	-----	2836 g	-----	-----	-----	-----	-----	-----	-----
PS03101445	2829	2901 g	-----	-----	-----	-----	-----	-----	-----
PS04100462	2647	2691 g	-----	-----	-----	-----	-----	-----	-----
PS05100120	2465	2310	-----	-----	-----	-----	-----	-----	-----
PS05100632	2754	2218	-----	-----	-----	-----	-----	-----	-----
PS05100736	2778	3158 ag	-----	-----	-----	-----	-----	-----	-----
PS05100840	2689	2624	-----	-----	-----	-----	-----	-----	-----
PS06100490	2694	2516	-----	-----	-----	-----	-----	-----	-----
PS06100760	**3137** ag	3034 ag	-----	-----	-----	-----	-----	-----	-----
Amigo	2674	2494	-----	-----	-----	-----	-----	-----	-----
PBL 29	2519	2478	-----	-----	-----	-----	-----	-----	-----
Green Means:	2687	2693	1192	3262	3093	2934 na	2632 na	3313 na	2259 na
	220	543.7	280	ns	299				
	5.8	12.31	16.0	7.0	5.4				
Trial Analysis:									
Trial Means	**2726**	**2785**	**1224**	**3429**	**3377**	**3145**	**2719**	**3483**	**2324**
LSD$_{0.05}$ (by t)	227	528	344	303	488.3	ns	ns	495	562
C.V.% (s/means)	6.0	11.7	19.8	6.2	8.7	14.19	12	9.89	16.9

[1/] - Conrad received damaging hail on July 19th, adverseley affecting yields; Cautious Interpretation warrented

[2/] - Grain moisture not reported; yields not adjusted to 13% grain moisture; are at "Field Moisture"

[3/] - Site rec'd rain/ hail on Aug 23rd; shattering occurred; yields were adjusted to account for hail losses.

[a] - Denotes yields equal to highest trial average yielding cultivar (in ***bold italics***), based on protected LSD$_{0.05}$.

[y] - Denotes yellow pea yields equal to higest yellow pea yield (in **bold**), based on protected LSD0.05.

[g] - Denotes green pea yields equal to highest green pea yield (in **bold**), based on protected LSD0.05.

[ns] - Denotes no statistical differences in means at the 0.05 level and LSD not protected at 0.05 level.

[na] - Denotes averages were not analyzed for signifcance.

DISCLAIMER - The information given herein is supplied with the understanding that no discrimination is intended and no endorsement by the Montana Agricultural Experiment Station is implied. The results of individual traits and studies are considered to be of a **preliminary** nature and should **not** be considered as a product endorsement or recommendation for commercial use. **NOT FOR PUBLICATION**

Table 5. 2010 Statewide/Private Treaty Dry Pea Evaluations - Mature Canopy Heights Summary.
Exp: 80. MSU-MAES, Central Ag. Research Center, Moccasin, MT - **NOT FOR REPRODUCTION**

Yellow Peas	**Moccasin**	**Richland[1/]**	**Havre**	**Sidney**	**Huntley**	**Corvallis**
	---------- inches ----------					
DS Admiral	**27.4** ay	***24.8*** ay	***29.2*** ay	***24.4*** ay	32.5	***34.2*** a
Delta	23.3	14.7	23.6	21.3 ay	32.3	28.5
CDC Golden	25.7 y	22.2 ay	27.6 ay	24.0 ay	**33.9** a	32.9 a
SW Midas	22.7	19.8	24.5	21.1 ay	31.7	31.9 a
CDC Mozart	20.5	18.4	24.2	21.7 ay	30.4	24.7
PS9910140	19.0	17.3	18.5	19.3	30.2	13.2
PS0010836	20.7	17.8	22.0	17.3	30.3	21.0
PS01102958	19.2	18.1	24.8	22.3 ay	31.9	25.8
PS03101822	19.4	18.6	22.7	-----	-----	-----
CDC Centennial	20.0	16.9	22.3	18.0	-----	-----
CDC Meadow	25.9 ay	22.2 ay	25.9	22.4 ay	-----	-----
LL 7020	25.1 y	23.6 ay	-----	-----	-----	-----
Salute	25.6 y	18.6	-----	19.0	-----	-----
Spider	27.6 ay	16.4	-----	-----	-----	-----
Trapeze	----	-----	-----	21.3 ay	-----	-----
Agassiz	23.1	-----	-----	-----	-----	-----
Thunderbird	27.0 ay	-----	-----	-----	-----	-----
LAN 4193	25.2 y	-----	25.9	-----	-----	-----
Montech 4152	27.0 ay	-----	26.2	-----	-----	-----
PRL 07-3	-----	16.1	-----	-----	-----	-----
Pro 073-7142	-----	19.4	-----	-----	-----	-----
Pro 083-7406	-----	20.5 y	-----	-----	-----	-----
SW 734	-----	22.0 ay	-----	-----	-----	-----
SW 739	-----	21.4 ay	-----	-----	-----	-----
Carousel	24.9 y	21.5 ay	-----	-----	-----	-----
PS04100710	18.6	16.1	-----	-----	-----	-----
PS05101240	20.1	10.5	-----	-----	-----	-----
PS06101043	25.5 y	17.6	-----	-----	-----	-----
PS06101119	19.2	16.9	-----	-----	-----	-----
Yellow Means:	23.5	19.2	24.4	21.0	31.7 na	26.5 na
LSD0.05 (by t)	2.6	4.6	2.3	4.3		
C.V.% (s/means)	7.9	14.5	6.6	12.2		
Trial Analysis:						
Trial Means	**23.2**	**18.7**	**24.6**	**20.9**	**32.4**	**27.2**
$LSD_{0.05}$ (by t)	2.6	4.0	2.3	3.8	3.3	4.8
C.V.% (s/means)	7.9	13.3	6.6	11.0	7.1	10.9

{Continued…}

Table 5. 2010 Statewide/Private Treaty Dry Pea Evaluations - Mature Canopy Heights Summary (Continued)
Exp: 80. MSU-MAES, Central Ag. Research Center, Moccasin, MT - **NOT FOR REPRODUCTION**

Green Peas	**Moccasin**	**Richland[1/]**	**Havre**	**Sidney**	**Huntley**	**Corvallis**
	---------- inches ----------					
Cruiser	23.5	18.6	24.8	19.56	34.9 [a]	29.9 [a]
Majoret	20.7	20.2 [g]	23.9	21.13 [a]	33.6 [a]	30.7 [a]
Medora	***28.3*** [ag]	21.9 [ag]	**28.4** [ag]	**22.83** [a/ns]	***36.2*** [a]	**33.4** [a]
Stirling	19.7	15.5	26.5 [g]	18.24	28.8	18.4
CDC Striker	24.3	**22.4** [ag]	20.1	22.05 [a]	34.8 [a]	29.5 [a]
CDC Patrick	25.1 [g]	21.8 [ag]	27.2 [ag]	20.47	-----	-----
K2	22.2	20.7 [g]	-----	20.34	-----	-----
Cooper	22.4	-----	-----	-----	-----	-----
Montech 1103	24.6 [g]	-----	-----	-----	-----	-----
Aragorn	22.1	20.3 [g]	24.2	-----	-----	-----
Pro 071-6101	-----	20.3 [g]	-----	-----	-----	-----
Pro 071-6102	-----	18.1	-----	-----	-----	-----
Pro 071-6103	-----	16.4	-----	-----	-----	-----
Pro 071-7111	-----	17.3	-----	-----	-----	-----
Pro 081-6118	-----	20.1 [g]	-----	-----	-----	-----
PS03101445	21.2	18.1	-----	-----	-----	-----
PS04100462	17.5	16.5	-----	-----	-----	-----
PS05100120	21.9	13.5	-----	-----	-----	-----
PS05100632	22.9	18.6	-----	-----	-----	-----
PS05100736	22.0	17.3	-----	-----	-----	-----
PS05100840	22.9	18.5	-----	-----	-----	-----
PS06100490	23.4	17.2	-----	-----	-----	-----
PS06100760	20.8	13.8	-----	-----	-----	-----
Amigo	20.0	11.3	-----	-----	-----	-----
PBL 29	18.7	10.8	-----	-----	-----	-----
Green Means	23.3	18.1	25.0	20.7	33.7 [na]	28.4 [na]
LSD0.05 (by t)	4.0	3.5	2.5	ns		
C.V.% (s/means)	7.3	11.6	6.8	8.3		
Trial Analysis:						
Trial Means	**23.2**	**18.7**	**24.6**	**20.9**	**32.4**	**27.2**
$LSD_{0.05}$ (by t)	2.6	4.0	2.3	3.8	3.3	4.8
C.V.% (s/means)	7.9	13.3	6.6	11.0	7.1	10.9

[a] - Denotes heights equal to tallest trial cultivar (in ***bold italics***) based on Protected $LSD_{0.05}$.

[y] - Denotes yellow pea heights equal to tallest yellow pea (in **bold**) based on protected $LSD_{0.05}$.

[g] - Denotes green pea heights equal to tallest green pea (in **bold**) based on protected $LSD_{0.05}$.

[ns] - Denotes no statistical significance among means, based on Protected $LSD_{0.05}$.

[1/] -Severe lodging observed throughout plot area, result of severe thunderstorm which passed through the area 2-days prior to grain harvest.

Table 6. 2010 Statewide/Private Treaty Dry Pea Evaluations - Dry Pea Grain Test Weights Summary.
-Exp: 80. MSU-MAES, Central Ag. Research Center, Moccasin, MT - **NOT FOR REPRODUCTION**

Yellow Peas	**Mocc.**	**Rich.**	**Conrad**[1/]	**Havre**	**Sidney**[2/]	**Bozemn**	**Huntley**	**Corvallis**	**Joplin**
---------- lbs bushel^{-1} ----------									
DS Admiral	64.5	64.5	**64.0** /ns	64.5	65.2 ay	64.9	64.2 a	65.1	58.1
Delta	65.5 ay	64.2	61.0	65.1	64.3	***65.9*** a	64.1 a	65.1	62.6 a
CDC Golden	65.1	64.9 y	61.3	65.5 ay	64.8 ay	65.2 a	***65.0*** a	65.0	60.3 a
SW Midas	64.2	64.0	62.7	64.4	65.0 ay	64.7	63.8	65.6	***63.0*** a
CDC Mozart	65.5 ay	***66.3*** ay	63.8	65.8 ay	65.0 ay	65.9 a	64.8 a	***66.4*** a	62.6 a
PS9910140	63.9	64.0	63.0	63.2	62.3	63.2	62.3	64.0	61.0 a
PS0010836	63.9	64.9 ay	62.1	63.8	64.0	64.9	63.3	64.1	59.5
PS01102958	65.2	66.0 ay	63.9	65.2	64.3	65.1	64.2 a	65.1	62.3 a
PS03101822	65.2	64.5	-----	63.7	-----	-----	-----	-----	-----
CDC Centennial	***66.4*** ay	65.0 ay	-----	***66.0*** ay	64.2	-----	-----	-----	-----
CDC Meadow	65.9 ay	65.1 ay	-----	65.9 ay	***65.3*** ay	-----	-----	-----	-----
LL 7020	65.8 ay	65.3 ay	-----	-----	-----	-----	-----	-----	-----
Salute	65.7 ay	64.3	-----	-----	64.7 ay	-----	-----	-----	-----
Spider	66.1 ay	65.3 ay	-----	-----	-----	-----	-----	-----	-----
Trapeze	-----	-----	-----	-----	64.0	-----	-----	-----	-----
LAN 4193	65.4 ay	-----	-----	65.0	-----	-----	-----	-----	-----
Montech 4152	65.5 ay	-----	-----	65.8 ay	-----	-----	-----	-----	-----
Agassiz	64.7	-----	-----	-----	-----	-----	-----	-----	-----
Thunderbird	64.3	-----	-----	-----	-----	-----	-----	-----	-----
PRL 07-3		63.8	-----	-----	-----	-----	-----	-----	-----
Pro 073-7142		64.1	-----	-----	-----	-----	-----	-----	-----
Pro 083-7406		65.1 ay	-----	-----	-----	-----	-----	-----	-----
SW 734		64.9 ay	-----	-----	-----	-----	-----	-----	-----
SW 739		63.9	-----	-----	-----	-----	-----	-----	-----
Carousel	66.0 ay	65.0 ay	-----	-----	-----	-----	-----	-----	-----
PS04100710	65.0	65.0 ay	-----	-----	-----	-----	-----	-----	-----
PS05101240	64.6	63.1	-----	-----	-----	-----	-----	-----	-----
PS06101043	62.7	62.8	-----	-----	-----	-----	-----	-----	-----
PS06101119	64.1	63.0	-----	-----	-----	-----	-----	-----	-----
Yellow Means:	64.9	64.5	63.1	64.9	64.4	65.0 na	64.0 na	65.1 na	61.2 na
LSD0.05 (by t)	1.2	1.6	ns	0.7	0.7				
C.V.% (s/means)	1.3	1.5	3.4	0.7	0.7				
Trial Analysis:									
Trial Means	**64.4**	**64.0**	**63.1**	**64.7**	**64.3**	**64.8**	**63.8**	**65.1**	**61.2**
$LSD_{0.05}$ (by t)	1.1	1.4	ns	0.6	0.8	0.8	1.0	0.7	2.7
C.V.% (s/means)	1.17	1.3	2.7	0.7	0.7	0.9	1.1	0.7	3.1

{Continued…}

Table 6. 2010 Statewide/Private Treaty Dry Pea Evaluations - Dry Pea Grain Yield Summary (Continued).
-Exp: 80. MSU-MAES, Central Ag. Research Center, Moccasin, MT - **NOT FOR REPRODUCTION**

Green Peas	**Mocc.**	**Rich.**	**Conrad[1/]**	**Havre**	**Sidney[2/]**	**Bozemn**	**Huntley**	**Corvalls**	**Joplin**
	---------- lbs bushel^{-1} ----------								
Cruiser	63.6	63.6	62.5	63.2	64.0	63.8	64.5 [a]	65.3	60.9 [a]
Majoret	64.4	**65.4** [ag]	***64.1*** [ns/g]	**65.4** [ag]	63.7	64.8	62.8	65.1	61.4 [a]
Medora	64.2	63.3	62.8	63.9	63.5	64.1	62.7	64.5	60.3 [a]
Stirling	64.1	63.6	62.8	64.1	63.8	64.7	63.8	64.5	61.3 [a]
CDC Striker	**66.1** [ag]	65.1 [ag]	64.0 [g]	65.2 [g]	64.5	**65.1** [/na]	**64.6** [a/na]	**65.7** [/na]	**62.5** [a/na]
CDC Patrick	64.3	64.7 [g]	63.7 [g]	65.2 [g]	63.8	-----	-----	-----	-----
K2	64.5	64.4 [g]	63.5 [g]	-----	**64.7** [/ns]	**-----**	**-----**	**-----**	**-----**
Cooper	64.7	-----	-----	-----	-----	-----	-----	-----	-----
Montech 1103	64.8	-----	-----	-----	-----	-----	-----	-----	-----
Aragorn	63.9	63.6	62.2	63.6	-----	-----	-----	-----	-----
Pro 071-6101	-----	63.8	-----	-----	-----	-----	-----	-----	-----
Pro 071-6102	-----	63.7	-----	-----	-----	-----	-----	-----	-----
Pro 071-6103	-----	65.4 [ag]	-----	-----	-----	-----	-----	-----	-----
Pro 071-7111	-----	64.3 [g]	-----	-----	-----	-----	-----	-----	-----
Pro 081-6118	-----	63.6	-----	-----	-----	-----	-----	-----	-----
PS03101445	64.4	63.9	-----	-----	-----	-----	-----	-----	-----
PS04100462	63.8	64.2	-----	-----	-----	-----	-----	-----	-----
PS05100120	63.4	62.7	-----	-----	-----	-----	-----	-----	-----
PS05100632	64.0	63.2	-----	-----	-----	-----	-----	-----	-----
PS05100736	63.9	64.4 [g]	-----	-----	-----	-----	-----	-----	-----
PS05100840	63.9	64.2	-----	-----	-----	-----	-----	-----	-----
PS06100490	64.7	62.5	-----	-----	-----	-----	-----	-----	-----
PS06100760	64.2	64.3 [g]	-----	-----	-----	-----	-----	-----	-----
Amigo	59.6	56.4	-----	-----	-----	-----	-----	-----	-----
PBL 29	57.7	56.3	-----	-----	-----	-----	-----	-----	-----
Green Means:	64.4	63.5	63.2	64.4	64.0	64.5 [na]	63.5 [na]	65.1 [na]	61.2 [na]
	1.0	1.2	1.0	0.6	ns				
	1.1	1.1	1.0	0.6	0.8				
Trial Analysis:									
Trial Means	**64.4**	**64.0**	**63.1**	**64.7**	**64.3**	**64.8**	**63.8**	**65.1**	**61.2**
$LSD_{0.05}$ (by t)	1.1	1.4	ns	0.6	0.8	0.8	1.0	0.7	2.7
C.V.% (s/means)	1.2	1.3	2.7	0.7	0.7	0.9	1.1	0.7	3.1

[1/] - Conrad received damaging hail on July 19th, adverseley affecting yields; Cautious Interpretation warrented

[2/] - Grain moisture not reported; yields not adjusted to 13% grain moisture; are at "Field Moisture"

[a] - Denotes test weights equal to highest trial test weight (in ***bold italics***), based on protected $LSD_{0.05}$.

[y] - Denotes yellow pea test wts equal to higest yellow pea test wts (in **bold**), based on protected LSD0.05.

[g] - Denotes green pea test wts equal to highest green pea test wts (in **bold**), based on protected LSD0.05.

[ns] - Denotes no statistical differences in means at the 0.05 level and LSD not protected at 0.05 level.

[na] - Denotes no statistical analysis performed on means.

Table 7. 2010 Statewide/Private Treaty Dry Pea Evaluations - Dry Pea Thousand Kernel Weights Summary.
-Exp: 80. MSU-MAES, Central Ag. Research Center, Moccasin, MT - **NOT FOR REPRODUCTION**

Yellow Peas	Moc/Rich[1/]	Conrad	Havre	Sidney	Bozeman	Huntley	Corvallis	Joplin
		---------- g 1,000-kernels $^{-1}$ ----------						
DS Admiral		255.5 ay	252.5	234.7	238.4	242.5 a	269.0 a	243.5
Delta		250.5 y	255.3	237.3	226.5	231.2	263.3 a	254.0
CDC Golden		258.5 ay	229.5	221.3	216.3	209.5	241.0	213.3
SW Midas		243.0	219.3	204.0	204.9	214.0	241.3	211.9
CDC Mozart		275.5 ay	240.6	231.7	224.9	229.6	258.8	236.1
PS9910140		275.0 ay	249.6	228.3	221.1	231.9	258.8	253.6
PS0010836		268.5 ay	260.2	258.0 ay	250.3 a	247.6 a	262.5 a	***268.9*** a
PS01102958		275.3 ay	262.6	**259.3** ay	***254.0*** a	***248.1*** a	***277.4*** a	250.5
PS03101822		-----	263.8	----	-----	-----	270.8 a	-----
CDC Centennial		-----	266.6 ay	245.7	-----	-----		-----
CDC Meadow		-----	215.4	212.3	-----	-----		-----
LL 7020		-----	-----	-----	-----	-----		-----
Salute		-----	-----	226.3	-----	-----		-----
Spider		-----	-----	-----	-----	-----		-----
Trapeze		-----	-----	252.7 ay	-----	-----		-----
LAN 4193		-----	249.2	-----	-----	-----		-----
Montech 4152		-----	***269.2*** ay	-----	-----	-----		-----
Agassiz		-----	-----	-----	-----	-----		-----
Thunderbird		-----	-----	-----	-----	-----		-----
PRL 07-3		-----	-----	-----	-----	-----		-----
Pro 073-7142		-----	-----	-----	-----	-----		-----
Pro 083-7406		-----	-----	-----	-----	-----		-----
SW 734		-----	-----	-----	-----	-----		-----
SW 739		-----	-----	-----	-----	-----		-----
Carousel		-----	-----	-----	-----	-----		-----
PS04100710		-----	-----	-----	-----	-----		-----
PS05101240		-----	-----	-----	-----	-----		-----
PS06101043		-----	-----	-----	-----	-----		-----
PS06101119		-----	-----	-----	-----	-----		-----
Yellow Means:		265.7	248.8	234.3	229.6 na	231.8 na	260.5 na	241.5 na
$LSD_{0.05}$ (by t)		25.9	4.6	8.3				
C.V.% (s/means)		6.8	1.3	2.1				
Trial Analysis:								
Trial Means		**256.6**	**239.2**	**227.5**	**224.4**	**223.8**	**251.8**	**233.9**
$LSD_{0.05}$ (by t)		22.6	5.2	7.8	12.3	10.6	16.1	12.4
C.V.% (s/means)		6.2	1.5	2.1	3.8	3.3	4.4	3.7

{Continued…}

Table 7. 2010 Statewide/Private Treaty Dry Pea Evaluations - Dry Pea TKW Summary (Continued).
-Exp: 80. MSU-MAES, Central Ag. Research Center, Moccasin, MT - **NOT FOR REPRODUCTION**

Green Peas	Moc/Rich[1/]	Conrad	Havre	Sidney	Bozeman	Huntley	Corvallis	Joplin
		---------- g 1,000-kernels $^{-1}$ ----------						
Cruiser		233.0	221.7	208.7	207.4	204.7	226.0	217.1
Majoret		257.5 [ag]	220.2	213.7	219.0	209.9	232.3	212.3
Medora		243.0	216.8	220.3	207.3	201.8	238.6	213.5
Stirling		238.5	219.1	214.3	212.1	202.8	231.5	220.3
CDC Striker		**264.8** [ag]	**252.1** [g]	**245.3** [g]	**235.1** [/na]	**235.7** [/na]	**260.8** [/na]	**245.4** [/na]
CDC Patrick		224.8	194.8	188.3	-----	-----	-----	-----
K2		252.0 [g]	-----	220.0	-----	-----	-----	-----
Cooper		-----	-----	-----	-----	-----	-----	-----
Montech 1103		-----	-----	-----	-----	-----	-----	-----
Aragorn		239.5	226.4	-----	-----	-----	-----	-----
Pro 071-6101		-----	-----	-----	-----	-----	-----	-----
Pro 071-6102		-----	-----	-----	-----	-----	-----	-----
Pro 071-6103		-----	-----	-----	-----	-----	-----	-----
Pro 071-7111		-----	-----	-----	-----	-----	-----	-----
Pro 081-6118		-----	-----	-----	-----	-----	-----	-----
PS03101445		-----	-----	-----	-----	-----	-----	-----
PS04100462		-----	-----	-----	-----	-----	-----	-----
PS05100120		-----	-----	-----	-----	-----	-----	-----
PS05100632		-----	-----	-----	-----	-----	-----	-----
PS05100736		-----	-----	-----	-----	-----	-----	-----
PS05100840		-----	-----	-----	-----	-----	-----	-----
PS06100490		-----	-----	-----	-----	-----	-----	-----
PS06100760		-----	-----	-----	-----	-----	-----	-----
Amigo		-----	-----	-----	-----	-----	-----	-----
PBL 29		-----	-----	-----	-----	-----	-----	-----
Green Means:		244.1	221.6	215.8	216.2 [na]	211.0 [na]	237.8 [na]	221.7 [na]
		17.3	6.5	6.5				
		4.8	2.0	1.7				
Trial Analysis:								
Trial Means		**256.6**	**239.2**	**227.5**	**224.4**	**223.8**	**251.8**	**233.9**
$LSD_{0.05}$ (by t)		22.6	5.2	7.8	12.3	10.6	16.1	12.4
C.V.% (s/means)		6.2	1.5	2.1	3.8	3.3	4.4	3.7

[1/] - Thousand Kernel Weights for Moccasin and Richland were not completed at time of printing.

[a] - Denotes TKWs equal to highest trial TKW (in ***bold italics***), based on protected $LSD_{0.05}$.

[y] - Denotes yellow pea TKWs equal to higest yellow pea TKW (in **bold**), based on protected LSD0.05.

[g] - Denotes green pea TKWs equal to highest green pea TKW (in **bold**), based on protected LSD0.05.

[ns] - Denotes no statistical differences in means at the 0.05 level and LSD not protected at 0.05 level.

[na] - Denotes Means were Not Analyzed at time of printing.

Table 8. 2010 Statewide/Private Treaty Dry Pea Evaluations - Dry Pea Flowering Dates Summary.
-Exp: 80. MSU-MAES, Central Ag. Research Center, Moccasin, MT - **NOT FOR REPRODUCTION**

Yellow Peas	Moccasin	Conrad	Havre	Sidney	Huntley	Corvallis
	---------- g 1,000-kernels $^{-1}$ ----------					
DS Admiral	30-Jun	4-Jul	27-Jun	25-Jun	12-Jun	1-Jul
Delta	28-Jun	1-Jul	25-Jun [y]	24-Jun	11-Jun	**28-Jun** [/na]
CDC Golden	30-Jun	5-Jul	27-Jun	24-Jun	12-Jun	1-Jul
SW Midas	30-Jun	4-Jul	27-Jun	24-Jun	11-Jun	1-Jul
CDC Mozart	29-Jun	**30-Jun**	**25-Jun** [y]	**22-Jun** [y]	**10-Jun** [/na]	30-Jun
PS9910140	29-Jun	2-Jul	25-Jun [y]	24-Jun	11-Jun	1-Jul
PS0010836	30-Jun	3-Jul	26-Jun [y]	25-Jun	10-Jun	28-Jun
PS01102958	30-Jun	4-Jul	28-Jun	25-Jun	13-Jun	1-Jul
PS03101822	29-Jun	-----	25-Jun [y]	----	-----	-----
CDC Centennial	29-Jun	-----	27-Jun	25-Jun	-----	-----
CDC Meadow	28-Jun [y]	-----	26-Jun	23-Jun [y]	-----	-----
LL 7020	**27-Jun** [y]	**-----**	**-----**	**-----**	**-----**	**-----**
Salute	28-Jun [y]	-----	-----	24-Jun	-----	-----
Spider	30-Jun	-----	-----	-----	-----	-----
Trapeze	-----	-----	-----	23-Jun [y]	-----	-----
LAN 4193	2-Jul	-----	26-Jun [y]	-----	-----	-----
Montech 4152	29-Jun	-----	27-Jun	-----	-----	-----
Agassiz	29-Jun	-----	-----	-----	-----	-----
Thunderbird	6-Jul	-----	-----	-----	-----	-----
Carousel	27-Jun [y]	-----	-----	-----	-----	-----
PS04100710	28-Jun	-----	-----	-----	-----	-----
PS05101240	28-Jun	-----	-----	-----	-----	-----
PS06101043	29-Jun	-----	-----	-----	-----	-----
PS06101119	27-Jun [y]	-----	-----	-----	-----	-----
Yellow Means:	29-Jun	2-Jul	26-Jun	24-Jun	11-Jun [na]	30-Jun [na]
$LSD_{0.05}$ (by t)	1		1	2		
C.V.% (s/means)	0.3		0.3	0.5		
Trial Analysis:						
Trial Means	**29-Jun**	**2-Jul**	**27-Jun**	**24-Jun**	**11-Jun**	**29-Jun**
$LSD_{0.05}$ (by t)	1		1	1	1	1
C.V.% (s/means)	0.4		0.3	0.5	0.4	0.4

{Continued…}

Table 8. 2010 Statewide/Private Treaty Dry Pea Evaluations - Dry Pea Flowering Summary (Continued).
-Exp: 80. MSU-MAES, Central Ag. Research Center, Moccasin, MT - **NOT FOR REPRODUCTION**

Green Peas	**Moccasin**	**Conrad**	**Havre**	**Sidney**	**Huntley**	**Corvallis**
	---------- g 1,000-kernels $^{-1}$ ----------					
Cruiser	30-Jun	30-Jun	26-Jun	24-Jun	11-Jun	28-Jun
Majoret	30-Jun	3-Jul	28-Jun	25-Jun	12-Jun	1-Jul
Medora	3-Jul	4-Jul	29-Jun	25-Jun	13-Jun	1-Jul
Stirling	25-Jun ^{g}	***29-Jun*** ^{na}	***22-Jun*** ^{ag}	***20-Jun*** ^{ag}	***6-Jun*** $^{a/na}$	***25-Jun*** $^{a/na}$
CDC Striker	30-Jun	1-Jul	27-Jun	25-Jun	12-Jun	1-Jul
CDC Patrick	2-Jul	5-Jul	29-Jun	25-Jun	-----	-----
K2	28-Jun	30-Jun	-----	22-Jun	-----	-----
Cooper	6-Jul	-----	-----	-----	-----	-----
Montech 1103	2-Jul	-----	-----	-----	-----	-----
Aragorn	28-Jun	1-Jul ^{a}	26-Jun	-----	-----	-----
PS03101445	30-Jun	-----	-----	-----	-----	-----
PS04100462	3-Jul	-----	-----	-----	-----	-----
PS05100120	29-Jun	-----	-----	-----	-----	-----
PS05100632	***24-Jun*** ^{ag}	-----	-----	-----	-----	-----
PS05100736	3-Jul	-----	-----	-----	-----	-----
PS05100840	2-Jul	-----	-----	-----	-----	-----
PS06100490	28-Jun	-----	-----	-----	-----	-----
PS06100760	1-Jul	-----	-----	-----	-----	-----
Amigo	25-Jun ^{g}	-----	-----	-----	-----	-----
PBL 29	26-Jun	-----	-----	-----	-----	-----
Green Means:	30-Jun	1-Jul	26-Jun	24-Jun	10-Jun ^{na}	29-Jun ^{na}
	2		1	1		
	0.4		0.3	0.4		
Trial Analysis:						
Trial Means	**29-Jun**	**2-Jul**	**27-Jun**	**24-Jun**	**11-Jun**	**29-Jun**
$LSD_{0.05}$ (by t)	1		1	1	1	1
C.V.% (s/means)	0.4		0.3	0.5	0.4	0.4

^{a} - Denotes flower dates equal to earliest trial flower date (in ***bold italics***), based on protected $LSD_{0.05}$.

^{y} - Denotes yellow pea flower dates equal to earliest yellow pea (in **bold**), based on protected LSD0.05.

^{g} - Denotes green pea flower dates equal to earliest green pea (in **bold**), based on protected LSD0.05.

^{ns} - Denotes no statistical differences in means at the 0.05 level and LSD not protected at 0.05 level.

^{na} - Denotes Means were Not Analyzed at time of printing.

Table 9. 2010 Montana Statewide Lentil Variety Evaluations - Lentil Grain Yield Summary.
Exp: 850010. Montana Ag. Experiment Stations - Central Ag. Research Center, Moccasin, MT

Variety	Bozeman	Conrad[1/]	Havre	Huntley	Moccasin	Sidney	Richland	Joplin	Corvallis	Creston
	---------- lbs acre^{-1} (@13% moisture; where applicable) ----------									
Small Green										
Essex	2111 [a]	436	**3119** [a]	464	2036	**2251** [a]	1752 [a]	1069	1087 [a]	2464 [a]
Medium Green										
Brewer	1855	381	2487	425	1768	1423	1324	1102	964 [a]	2164
CDC Meteor	2021 [a]	583	3001 [a]	494	1816	2072 [a]	1842 [a]	1558 [a]	742	1870
CDC Richlea	**2266** [a]	623 [a]	2853 [a]	569	**2062** [ns]	1959 [a]	1562 [a]	**1731** [a]	973 [a]	2150
CDC Vantage	1864	464	2822 [a]	416	2005	1907 [a]	1590 [a]	1422 [a]	530	1872
LC01602300R	2224 [a]	687 [a]	2790 [a]	**926** [a]	1944	2169 [a]	**1850** [a]	1439 [a]	1052 [a]	**2626** [a]
Large Green										
Merritt	2064 [a]	385	2868 [a]	466	1890	1350	1435	1175	690	1954
Pennell	2021 [a]	562	2832 [a]	521	1950	1796	1352	1118	782 [a]	1995
Riveland	1825	324	2463	399	1805	1564	1571 [a]	1285	430	1898
Small Red										
Crimson	1999 [a]	544	2343	738 [a]	1919	1924 [a]	1222	988	**1095** [a]	2259 [a]
CDC Redberry	982	**833** [a]	2592	684 [a]	1642	2186 [a]	1390	749	1059 [a]	2346 [a]
LC01602026T	2242 [a]	405	2372	674 [a]	1978	1774	1642 [a]	1246	718	2331 [a]
Pardina										
LC01602245P	1921 [a]	701 [a]	3033 [a]	682 [a]	1963	1480	1443	1092	1060 [a]	2201 [a]
Means	1953	533	2736	573	1906	1835	1537	1229	860	2164
$LSD_{0.05}$ (by t)	382	214	340	272	NS	390	294	402	348	456
CV% (s/means)	13.5	28	8.67	33.0	10.87	12.62	11.35	22.8	28.24	14.7
Trial Means[†]	**1953**	**533**	**2736**	**573**	**1844**	**1835**	**1459**	**1229**	**860**	**2164**

[1/] - Conrad site received hail on July 19th and Sep 5th; yields were negatively impacted; cautious interpretation of results is warranted.

[†] - Means for entire trial; Statewide Trial was incorporated into larger trials at different locations.

[a] - Denote values of equal equivelance within all varieties tested, based on a protected $LSD_{0.05}$.

[ns] - Denotes no statistical differences in means at the 0.05 level and LSD not protected at 0.05 level.

Table 10. 2010 Montana Statewide Lentil Variety Evaluations - Lentil Mature Canopy Height Summary.
Exp: 850010. Montana Ag. Experiment Stations - Central Ag. Research Center, Moccasin, MT

Variety	Havre	Huntley	Conrad	Moccasin	Sidney	Richland	Corvallis	Creston
	---------- in ----------							
Small Green								
Essex	**13.3** [a]	17.1 [a]	20.3 [a]	13.0 [a]	11.0 [a]	12.3 [a]	11.6 [a]	7.8
Medium Green								
Brewer	10.4	**18.8** [a]	18.3 [a]	12.3 [a]	11.4 [a]	11.4	9.9	7.0
CDC Meteor	12.0 [a]	17.8 [a]	19.3 [a]	12.5 [a]	10.6	12.7 [a]	9.4	8.0
CDC Richlea	10.6	17.2 [a]	**20.5** [a]	13.3 [a]	9.8	11.9 [a]	11.1 [a]	8.0
CDC Vantage	9.5	17.4 [a]	17.3	13.4 [a]	10.9 [a]	12.6 [a]	8.6	7.8
LC01602300R	10.9	19.1 [a]	18.8 [a]	13.2 [a]	**12.5** [a]	12.6 [a]	11.5 [a]	9.0
Large Green								
Merritt	11.6	17.6 [a]	15.8	12.9 [a]	11.2 [a]	11.4	9.9	9.3
Pennell	11.6	16.2	19.5 [a]	12.6 [a]	11.3 [a]	12.7 [a]	11.4 [a]	9.3
Riveland	11.7	18.4 [a]	18.0	**13.5** [a]	11.4 [a]	**13.6** [a]	9.9	6.5
Small Red								
Crimson	9.8	15.3	16.0	9.4	9.3	10.4	10.9	7.5
CDC Redberry	12.3 [a]	18.0 [a]	16.5	12.5 [a]	13.3 [a]	11.7	**12.9** [a]	**13.0** [a]
LC01602026T	10.0	17.1 [a]	16.8	11.9	11.0 [a]	11.4	10.2	8.0
Pardina								
LC01602245P	9.6	16.3	16.5	11.0	8.4	8.8	9.8	6.5
Means	11.0	17.4	17.9	12.4	10.9	11.8	10.6	8.3
$LSD_{0.05}$ (by t)	1.6	2.2	2.5	1.2	1.8	1.8	1.9	2.8
CV% (s/means)	8.98	8.70	9.90	6.95	9.74	8.95	12.55	23.7
Trial Means[†]	**11.0**	**17.4**	**17.9**	**12.1**	**10.9**	**11.9**	**10.6**	**8.3**

[†] - Means for entire trial; Statewide Trial was incorporated into larger trials at different locations.

[a] - Denote values of equal equivelance within all varieties tested, based on a protected $LSD_{0.05}$.

[y] - Denotes the highest yellow pea canopy height statistically similar, based on $LSD_{0.05}$, at each location.

[g] - Denotes the highest green pea canopy height statistically similar, based on $LSD_{0.05}$, at each location.

DISCLAIMER

The information given herein is supplied with the understanding that no discrimination is intended and no endorsement by the Montana Agricultural Experiment Station is implied. The results of individual traits and studies are considered to be of a **preliminary** nature and should **not** be considered as a product endorsement or recommendation for commercial use.

NOT FOR PUBLICATION

Table 11. 2010 Montana Statewide Lentil Variety Evaluations - Lentil Test Weight Summary.
Exp: 850010. Montana Ag. Experiment Stations - Central Ag. Research Center, Moccasin, MT

Variety	Bozeman	Conrad	Havre	Huntley	Moccasin	Sidney	Richland	Joplin	Corvallis	Creston
	---------- lbs bu^{-1} ----------									
Small Green										
Essex	65.1	57.4	64.5	60.5	63.4	61.7	64.1	57.4	64.0 [a]	62.7 [a]
Medium Green										
Brewer	62.7	53.7	62.0	56.7	60.4	59.5	61.5	57.4	57.9	60.2
CDC Meteor	64.6	57.5	63.5	58.8	61.9	61.0	63.0	59.7 [a]	58.9	61.2
CDC Richlea	63.6	56.5	62.7	57.3	61.3	60.8	62.1	58.5 [a]	58.4	59.9
CDC Vantage	65.0	57.2	63.5	58.6	62.8	61.0	63.2	58.7 [a]	54.3	58.2
LC01602300R	64.5	58.2 [a]	64.0	59.0	62.5	61.2	63.2	**60.4** [a]	61.4 [a]	61.4
Large Green										
Merritt	62.5	54.4	62.0	56.9	60.1	59.0	61.0	56.6	57.4	59.6
Pennell	62.3	56.2	61.5	56.8	59.9	59.7	60.9	56.0	57.5	59.2
Riveland	61.4	52.4	61.0	53.7	58.8	57.8	60.2	56.0	52.3	58.0
Small Red										
Crimson	65.9	58.9 [a]	65.3 [a]	61.5 [a]	64.4	62.5	64.7 [a]	59.5 [a]	**64.8** [a]	**64.1** [a]
CDC Redberry	65.5	**60.6** [a]	64.5	61.1 [a]	63.9	62.5	64.2	56.4	64.3 [a]	62.6 [a]
LC01602026T	65.8	54.8	64.8 [a]	58.9	63.7	62.5	64.2	60.3 [a]	57.8	62.7 [a]
Pardina										
LC01602245P	**67.1** [a]	58.5 [a]	**65.3** [a]	**61.7** [a]	**64.7** [a]	**63.8** [a]	**64.8** [a]	60.4 [a]	62.9 [a]	64.0 [a]
Means	64.3	56.6	63.4	58.6	62.1	61.0	62.9	58.3	59.4	61.1
$LSD_{0.05}$ (by t)	0.4	2.6	0.8	0.7	0.3	0.7	0.4	2.8	5.0	2.2
CV% (s/means)	0.41	3.20	0.84	0.80	0.33	0.70	0.38	3.3	5.83	2.48
Trial Means[†]	**64.3**	**56.6**	**63.4**	**58.6**	**63.2**	**61.0**	**63.3**	**58.3**	**59.4**	**61.1**

[†] - Means for entire trial; Statewide Trial was incorporated into larger trials at different locations.

[a] - Denote values of equal equivelance within all varieties tested, based on a protected $LSD_{0.05}$.

[y/g] - Denotes the highest yellow (y) and green (g) pea test weights statistically similar, based on $LSD_{0.05}$, at each location.

[ns] - Denotes no statistical differences in means at the 0.05 level and LSD not protected at 0.05 level.

Table 12. 2010 Montana Statewide Lentil Variety Evaluations - Lentil Thousand Kernel Weights Summary.
Exp: 850010. Montana Ag. Experiment Stations - Central Ag. Research Center, Moccasin, MT

Variety	**Bozeman[1/]**	**Havre**	**Huntley**	**Moccasin**	**Sidney**	**Corvallis**	**Joplin**
	---------- (g 1000-kernels^{-1}) ----------						
Small Green							
Essex	44.1	56.0	41.7		46.0	50.5	43.8
Medium Green							
Brewer	57.1	61.8	51.7		61.3	56.5	55.1
CDC Meteor	50.0	50.7	45.7		48.0	50.0	43.8
CDC Richlea	51.6	57.0	46.7		52.3	49.3	48.0
CDC Vantage	50.5	53.2	43.7		49.0	49.8	49.4
LC01602300R	50.2	53.0	44.8		51.0	49.0	40.8
Large Green							
Merrit	60.2	63.5	53.1	Pending	62.7	61.5 [a]	60.3 [a]
Pennell	62.8	68.7 [a]	56.6 [a]		63.0	58.5 [a]	59.5
Riveland	**72.7** [a]	**71.9** [a]	**57.7** [a]		**71.7** [a]	**71.0** [a]	**66.3** [a]
Small Red							
Crimson	34.2	37.3	32.1		34.7	44.3	33.8
CDC Redberry	38.5	44.9	40.0		42.7	49.8	39.9
LC01602026T	45.8	47.1	42.1		43.7	51.3	44.3
Pardina							
LC01602245P	37.3	43.0	36.2		38.7	39.0	36.1
Means	50.4	54.4	45.5		51.1	52.3	47.8
$LSD_{0.05}$ (by t)	2.3	8.3	1.8		2.5	13.9	6.3
CV% (s/means)	3.23	10.65	2.70		2.87	18.55	9.10
Trial Means[†]	**50.4**	**54.4**	**45.5**		**51.1**	**52.3**	**47.8**

[†] - Means for entire trial; Statewide Trial was incorporated into larger trials at different locations.

[a] - Denote values of equal equivelance within all varieties tested, based on a protected $LSD_{0.05}$.

[y] - Denotes the earliest yellow pea flowering date statistically similar, based on $LSD_{0.05}$, at each location.

[g] - Denotes the earliest green pea flowering date statistically similar, based on $LSD_{0.05}$, at each location.

[na] - Denotes not analyzed or no variability between replications.

DISCLAIMER

The information given herein is supplied with the understanding that no discrimination is intended and no endorsement by the Montana Agricultural Experiment Station is implied. The results of individual traits and studies are considered to be of a **preliminary** nature and should **not** be considered as a product endorsement or recommendation for commercial use.

NOT FOR PUBLICATION

Table 13. 2010 Montana Statewide Lentil Variety Evaluations - Lentil Flower Dates Summary.
Exp: 850010. Montana Ag. Experiment Stations - Central Ag. Research Center, Moccasin, MT

Variety	Conrad	Havre	Huntley	Moccasin	Sidney	Corvallis	Creston
				(date)			
Small Green							
Essex	1-Jul	25-Jun	Jun 12	28-Jun	23-Jun	30-Jun	30-Jun
Medium Green							
Brewer	**28-Jun** [na]	**21-Jun** [a]	Jun 10	**24-Jun** [a]	**21-Jun** [a]	**28-Jun** [a]	**29-Jun** [ns]
CDC Meteor	1-Jul	26-Jun	Jun 12	28-Jun	24-Jun	1-Jul	30-Jun
CDC Richlea	1-Jul	25-Jun	Jun 13	27-Jun	24-Jun	1-Jul	1-Jul
CDC Vantage	30-Jun	25-Jun	Jun 12	26-Jun	22-Jun [a]	1-Jul	29-Jun
LC01602300R	30-Jun	24-Jun	Jun 12	26-Jun	22-Jun [a]	1-Jul	29-Jun
Large Green							
Merrit	29-Jun	22-Jun	Jun 9 [a]	**24-Jun** [a]	21-Jun [a]	**28-Jun** [a]	29-Jun
Pennell	**28-Jun** [na]	23-Jun	Jun 10	24-Jun [a]	21-Jun [a]	28-Jun [a]	29-Jun
Riveland	29-Jun	24-Jun	Jun 10	25-Jun	22-Jun [a]	29-Jun	29-Jun
Small Red							
Crimson	1-Jul	25-Jun	Jun 12	27-Jun	23-Jun	1-Jul	29-Jun
CDC Redberry	1-Jul	26-Jun	Jun 10	27-Jun	23-Jun	1-Jul	29-Jun
LC01602026T	**28-Jun** [na]	24-Jun	Jun 9 [a]	25-Jun	20-Jun [a]	**28-Jun** [a]	**30-Jun**
Pardina							
LC01602245P	**28-Jun** [na]	24-Jun	**Jun 9** [a]	25-Jun	21-Jun [a]	28-Jun [a]	30-Jun
Means	29-Jun	24-Jun	Jun 11	26-Jun	22-Jun	29-Jun	29-Jun
$LSD_{0.05}$ (by t)		1.0	1.3	0.6	1.5	1.3	NS
CV% (s/means)		0.38	0.6	0.23	0.53	0.49	0.38
Trial Means[†]		**24-Jun**	**11-Jun**	**26-Jun**	**22-Jun**	**29-Jun**	**29-Jun**

[†] - Means for entire trial; Statewide Trial was incorporated into larger trials at different locations.

[a] - Denote values of equal equivelance within all varieties tested, based on a protected $LSD_{0.05}$.

[y] - Denotes the earliest yellow pea flowering date statistically similar, based on $LSD_{0.05}$, at each location.

[g] - Denotes the earliest green pea flowering date statistically similar, based on $LSD_{0.05}$, at each location.

[na] - Denotes not analyzed or no variability between replications.

DISCLAIMER

The information given herein is supplied with the understanding that no discrimination is intended and no endorsement by the Montana Agricultural Experiment Station is implied. The results of individual traits and studies are considered to be of a **preliminary** nature and should **not** be considered as a product endorsement or recommendation for commercial use.

NOT FOR PUBLICATION

Table 14. 2010 Western Regional Lentil Trial - Moccasin, Montana Agronomic Summary.
Exp: 860710. Montana Ag. Experiment Stations - Central Ag. Research Center, Moccasin, MT

Entry	Grain Yield		Flower	Canopy Ht	Test Wt	Grain Moisture
	Harvest	13% Moist				
	---------- (lbs acre^{-1}) ----------		(date)	(cm)	(lbs bu^{-1})	(%)
Small Green						
Eston	1976 [ab]	2021 [ab]	27-Jun	31.6 [b]	64.6	10.9 [a]
Essex	1996 [ab]	2036 [ab]	28-Jun	33.0 [ab]	63.4	11.3 [a]
LC03601590E	**2119** [ab]	**2165** [ab]	26-Jun	31.8 [b]	63.8	11.2 [a]
LC01602273E	1981 [ab]	2021 [ab]	24-Jun	30.5 [b]	64.3	11.2 [a]
Large Green						
Merritt	1852 [b]	1890 [b]	**24-Jun** [a]	32.8 [ab]	60.1	11.1 [a]
Pennell	1912 [ab]	1950 [ab]	24-Jun [a]	32.0 [ab]	59.9	11.2 [a]
Rivleand	1772 [b]	1805 [b]	25-Jun	34.3 [ab]	58.8	11.4 [a]
LC06600839L	1485	1524	26-Jun	32.5 [ab]	59.3	10.7 [a]
LC06601734L	1625	1663	28-Jun	**34.5** [ab]	59.6	11.0 [a]
LC07600517L	1888 [ab]	1932 [ab]	28-Jun	32.5 [ab]	60.3	11.0 [a]
Small Red						
Crimson	1870 [b]	1919 [ab]	27-Jun	23.8	64.4	10.7 [a]
LC06601228T	1991 [ab]	2035 [ab]	25-Jun	31.1 [b]	65.2	11.1 [a]
Pardina						
Pardina	2069 [ab]	2118 [ab]	25-Jun	25.8	**67.7** [a]	11.0 [a]
LC06600907P	1838 [b]	1873 [b]	29-Jun	26.5	64.9	11.3 [a]
LC02601144P	1976 [ab]	2010 [ab]	26-Jun	31.3 [b]	65.2	**11.5** [a]
Zero Tannin-Red						
Cedar	1147	1191	27-Jun	31.8 [b]	64.0	9.6
LC9602585RZ	1427	1466	26-Jun	28.5	65.1	10.6
Zero Tannin-Green						
Shasta	1657 [b]	1721 [b]	24-Jun	34.5 [ab]	62.5	9.7
LC07600224YZ	1413 [b]	1474 [b]	26-Jun	33.1 [ab]	62.3	9.3
Medium Green						
CDC Vantage	1955 [ab]	2006 [ab]	26-Jun	34.0 [ab]	62.8	10.8 [a]
CDC Richlea	2023 [ab]	2063 [ab]	27-Jun	33.8 [ab]	61.3	11.3 [a]
LC01602300R	1896 [ab]	1933 [ab]	26-Jun	33.6 [ab]	62.6	11.3 [a]
Trial Means	1812	1855	26-Jun	31.5	62.8	10.9
$LSD_{0.05}$ (by t)	248	250	0.7	2.6	1.4	0.8
C.V.% (s/means)	9.66	9.49	0.29	5.72	1.58	5.43
F-Value	8.21	8.03	26.09	10.45	23.19	4.14
P-Value	0.00	0.00	0.00	0.00	0.00	0.00

[a] - Denotes values equal to highest/earliest entry (in **bold**) based on the protected $LSD_{0.05}$.

[b] - Denotes the statistically similar highest values within a pea type (i.e. Yellow and Green peas).

[ns] or NS - Denotes means not significantly different or LSD was not protected at 0.05 level (see "P-Value").

Table 15. 2010 Western Regional Lentil Trial - Richland, Montana Agronomic Summary.
Exp: 861910. Montana Ag. Experiment Stations - Central Ag. Research Center, Moccasin, MT

ENTRY	Grain Yield		Canopy Ht	Test Wt	Grain Moisture
	Harvest	13% Moist			
	---------- (lbs acre^{-1}) ----------		(cm)	(lbs bu^{-1})	(%)
Small Green					
Eston	1665 [ab]	1679 [ab]	31.0 [ab]	65.0 [a]	12.3 [a]
Essex	**1751** [ab]	**1752** [ab]	31.3 [ab]	64.1	**12.9** [a]
LC03601590E	1580 [ab]	1585 [ab]	29.0 [b]	64.1	12.7 [a]
LC01602273E	1307	1317	30.3 [b]	64.3	12.3 [a]
Large Green					
Merrit	1436 [b]	1447 [b]	30.3	61.0	12.3 [a]
Pennell	1343 [b]	1352 [b]	32.3 [ab]	60.9	12.5 [a]
Riveland	1567 [ab]	1571 [ab]	**34.7** [ab]	60.2	12.7 [a]
LC06600839L	1280	1283	30.7	59.6	12.7 [a]
LC06601734L	1502 [ab]	1506 [ab]	32.3 [ab]	60.6	12.7 [a]
LC07600517L	1572 [ab]	1584 [ab]	28.3	61.4	12.3 [a]
Small Red					
Crimson	1183	1222	26.3 [b]	64.7	10.1
LC06601228T	1526 [a]	1542 [a]	28.0 [b]	**65.4** [a]	12.1
Pardina					
Pardina	1302	1348	25.7	65.0 [a]	9.9
LC02601144P	1672 [ab]	1691 [ab]	31.7 [a]	65.4 [a]	12.0
LC06600907P	1688 [ab]	1720 [ab]	23.7	65.1 [a]	11.3
Zero Tannin-Red					
Cedar	937 [b]	944 [b]	30.0 [b]	65.0 [a]	12.3 [a]
LC9602585RZ	899 [b]	906 [b]	30.0 [b]	65.0 [a]	12.4 [a]
Zero Tannin-Yellow					
Shasta	1345 [b]	1348 [b]	33.0 [ab]	63.4	12.6 [a]
LC07600224YZ	1299 [b]	1307 [b]	34.0 [ab]	63.2	12.5 [a]
Medium Green					
CDC Vantage	1574 [ab]	1590 [ab]	32.0 [ab]	63.2	12.1
CDC Richlea	1556 [a]	1562 [a]	30.3 [b]	62.1	12.6 [a]
LC01602300R	1835 [ab]	1850 [ab]	32.0 [ab]	63.2	12.3 [a]
Trial Means	1446	1459	30.3	63.3	12.2
$LSD_{0.05}$ (by t)	273	269	3.7	0.5	0.7
C.V.% (s/means)	11.43	11.19	7.36	0.51	3.71
F-Value	6.4	6.6	4.3	101.2	8.8
P-Value	0.00	0.00	0.00	0.00	0.00

[a] - Denotes values equal to highest/earliest entry (in **bold**) based on the protected $LSD_{0.05}$.

[b] - Denotes the statistically similar highest values within a pea type (i.e. Yellow and Green peas).

[ns] or NS - Denotes means not significantly different or LSD was not protected at 0.05 level (see "P-Value").

Table 16. 2010 Chickpea Variety/LineEvaluations - Agronomic Summary. - Exp 89. MSU-MAES, CARC, Moccasin, Montana

	Grain Yield			Richland	Grain Moisture		Grain Mature Ht			Test Weights		Flower Date	
ENTRY	Mocc.	Havre	Rich.[1/]	Disease[2/]	Mocc.	Havre	Mocc.	Havre	Rich.	Mocc.	Havre	Mocc.	Havre
	---------- lbs acre^{-1} ----------			(1 - 5)	------- % -------		---------- inches ----------			-------- lbs bu^{-1} -------		----- date -----	
Dwelley	1556	1231	87	3.7	9.7	**11.9** [a]	15.6 [a]	15.8 [a]	16.0	57.6	59.6 [ns]	10-Jul	2-Jul
Dylan	1317	------	224	3.7	11.5 [a]	------	13.9	------	13.1	54.4	------	5-Jul	------
Sawyer	1459	------	**662** [a]	4.3 [a]	**12.2** [a]	------	14.9	------	15.9	57.8	------	6-Jul	------
Sierra	1279	------	233	4.0	9.4	------	15.4	------	15.0	58.0	------	7-Jul	------
CA0469C025C	1398	------	389	**5.0** [a]	11.3 [a]	------	13.6	------	12.5	57.8	------	3-Jul	------
CA049004221C	1402	------	554 [a]	4.7 [a]	11.8 [a]	------	14.3	------	13.5	57.3	------	3-Jul	------
CA04900843C	1359	------	155	4.0	9.5	------	15.5 [a]	------	15.1	57.2	------	8-Jul	------
CA04900851C	1523	------	214	4.3 [a]	9.6	------	16.4 [a]	------	16.3 [a]	57.7	------	9-Jul	------
CA0390B007C	1373	------	299	**5.0** [a]	9.9	------	15.9 [a]	------	15.7	58.2	------	10-Jul	------
CA04900808C	1500	------	211	3.7	9.7	------	**16.5** [a]	------	**17.2** [a]	57.8	------	6-Jul	------
AC 45226	1610	------			8.8	------	13.1	------	------	55.9	------	2-Jul	------
AC48111	1441	1367	190	2.7	8.5	10.3	13.3	13.3	10.4	56.2	56.5	1-Jul	28-Jun
IS 02	1484	------			9.2	------	13.3	------	------	58.9 [a]	------	30-Jun [a]	------
IS 04	1361	------			9.0	------	14.2	------	------	58.3	------	1-Jul [a]	------
IS 05	1605	1518 [a]	139	3.0	8.8	11.3	14.0	15.2 [a]	12.1	58.4 [a]	58.8	1-Jul [a]	26-Jun [a]
IS 06	1467	------			9.9	------	14.7	------	------	58.6 [a]	------	30-Jun [a]	------
IS 07	1536	------			9.1	------	13.4	------	------	**59.0** [a]	------	30-Jun [a]	------
IS 08	1404	------			8.9	------	14.6	------	------	58.7 [a]	------	1-Jul	------
IS 09	1437	1494 [a]	130	2.7	9.9	11.2	14.5	14.4	12.3	57.7	58.3	**30-Jun** [a]	26-Jun [a]
IS 14	1696	**1726** [a]	150	3.3	11.9 [a]	11.5 [a]	15.3	**15.9** [a]	13.9	57.3	58.3	30-Jun [a]	**26-Jun** [a]
IS 18	1446	------			9.1	------	13.8	------	------	58.4 [a]	------	**30-Jun** [a]	------
IS 21	**1773** [ns]	1388	5	0.9	8.9	10.6	12.6	12.5	11.0	57.8	56.6	4-Jul	28-Jun
IS 22	1621	------			8.9	------	13.3	------	------	58.3 [a]	------	**30-Jun** [a]	------
IS 28	1701	------			10.4	------	12.4	------	------	57.5	------	6-Jul	------
Trial Means	**1489**	**1454**	**242**	**3.7**	**9.8**	**11.1**	**14.3**	**14.5**	**14.0**	**57.7**	**58.0**	**3-Jul**	**28-Jun**
$LSD_{0.05}$ (by t)	ns	235	149	0.9	1.2	0.5	1.1	1.2	1.2	0.7	ns	2	1
C.V.% (s/means)	18.52	10.74	36.7	15.1	8.6	3.0	5.6	5.52		0.85	3.3	0.62	0.42

[a] - Denotes values equal to greatest/earliest value (in **bold**) based on protected $LSD_{0.05}$. [ns] - Denotes no statistical differences among means.

[1/] - Richland site was hit by severe *Ascochyta* blight, which significantly affected yields; yields reported should be interpreted with caution.

[2/] - Disease scale: 1- No or Little Disease Resistance (severely diseased); 5 - Good Disease Resistance (little disease pressure).

Table 17. 2010 Statewide Dry Pea Variety Evaluations - 2008-2010 Preliminary Multi-year Grain Yield Summary.
Exp: 80. MSU-Montana Ag. Experiment Stations, Central Ag. Research Center, Moccasin, Montana.

	Bozeman		Conrad		Corvallis		Havre		Huntley		Moccasin		Richland		Sidney	
Cultivar	2008-10		2008-10		2008-10		2008-10		2008-10		2008-10		2008-10		2008-10	
Yellow Peas	lbs ac^{-1}	%Ave¶	lbs ac^{-1}	%Ave¶	lbs ac^{-1}	%Ave¶	lbs ac^{-1}	%Ave¶	lbs ac^{-1}	%Ave¶	lbs ac^{-1}	%Ave¶	lbs ac^{-1}	%Ave¶	lbs ac^{-1}	%Ave¶
Delta	2386	100	2347	94	2891	100	3022	102	2223	100	**1769**	**110**	2291	103	2137	101
DS Admiral	2590	**107**	2262	97	2556	91	2815	96	**2706**	101	1620	106	**2273**	109	1950	88
CDC Golden[1/]	2701	100	2277	94	3256	98	2948	100	2582	96	1631	106	2344	**114**	**2904**	109
SW Midas[1/]	**2727**	98	2416	99	3429	102	2837	96	2545	95	1401	84	1921	77	2575	92
CDC Mozart	2516	105	2482	103	3038	104	**3241**	**110**	2507	**109**	1663	102	2493	112	2633	**120**
PS9910140	2535	91	**2600**	**117**	**3458**	**125**	2993	101	2366	108	1623	101	2331	96	2372	104
PS0010836	2714	99	2138	88	2655	93	3043	103	2273	96	1560	97	2507	103	2225	101
PS01102958	2632	95	2476	105	2517	87	2731	91	2142	93	1487	93	1995	79	1877	85
Green Peas																
Majoret	2331	101	2284	**115**	3055	**113**	2832	103	2241	100	1474	97	2220	106	2157	101
Cruiser	2242	96	1904	89	2507	90	2728	99	2548	100	1454	93	1965	94	2008	100
Medora	2278	100	1963	96	2676	99	2604	95	1920	88	1562	104	2170	105	2044	100
Stirling	2438	**106**	2248	101	2774	101	2901	**106**	2450	**114**	1643	**109**	1907	93	1956	94
CDC Striker[1/]	2464	96	2168	97	3106	96	2686	97	2486	97	1434	97	2447	**106**	2698	**107**
Statewide Means	**2481**		**2273**		**2888**		**2876**		**2356**		**1563**		**2209**		**2234**	
Yellow Average	2584		2377		2941		2954		2391		1594		2268		2297	
Green Average	2342		2109		2804		2750		2300		1513		2120		2135	

† - Means for entire trial; Statewide Trial was incorporated into larger trials at different locations.

¶ - Estimation of performance as a comparison of a Variety's Yield to Pea-Type Average Yield (i.e. Yellow, Green), on a yearly basis; Value is the average of the yearly comparisons

1/ - Varieties were not included in the statewide evaluation in 2008, but were tested at Moccasin, Havre and Richland.

DISCLAIMER

The information given herein is supplied with the understanding that no discrimination is intended and no endorsement by the Montana Agricultural Experiment Station is implied. The results of individual traits and studies are considered to be of a **preliminary** nature and should **not** be considered as a product endorsement or recommendation for commercial use. **NOT FOR PUBLICATION**

Table 18. 2010 Statewide Dry Pea Variety Evaluations - 2008-2010 Preliminary Multi-year Grain Yield Summary.
Exp: 80. MSU-Montana Ag. Experiment Stations, Central Ag. Research Center, Moccasin, Montana.

	Bozeman		Conrad		Corvallis		Havre		Huntley		Moccasin		Richland		Sidney	
Cultivar	2008-10		2008-10		2008-10		2008-10		2008-10		2008-10		2008-10		2008-10	
Yellow Peas	lbs ac^{-1}	%Ave¶	lbs ac^{-1}	%Ave¶	lbs ac^{-1}	%Ave¶	lbs ac^{-1}	%Ave¶	lbs ac^{-1}	%Ave¶	lbs ac^{-1}	%Ave¶	lbs ac^{-1}	%Ave¶	lbs ac^{-1}	%Ave¶
Delta	2386	100	2347	94	2891	100	3022	102	2223	100	**1769**	**110**	2291	103	2137	101
DS Admiral	2590	**107**	2262	97	2556	91	2815	96	**2706**	101	1620	106	**2273**	109	1950	88
CDC Golden[1/]	2701	100	2277	94	3256	98	2948	100	2582	96	1631	106	2344	**114**	**2904**	109
SW Midas[1/]	**2727**	98	2416	99	3429	102	2837	96	2545	95	1401	84	1921	77	2575	92
CDC Mozart	2516	105	2482	103	3038	104	**3241**	**110**	2507	**109**	1663	102	2493	112	2633	**120**
PS9910140	2535	91	**2600**	**117**	**3458**	**125**	2993	101	2366	108	1623	101	2331	96	2372	104
PS0010836	2714	99	2138	88	2655	93	3043	103	2273	96	1560	97	2507	103	2225	101
PS01102958	2632	95	2476	105	2517	87	2731	91	2142	93	1487	93	1995	79	1877	85
Green Peas																
Majoret	2331	101	2284	**115**	3055	**113**	2832	103	2241	100	1474	97	2220	106	2157	101
Cruiser	2242	96	1904	89	2507	90	2728	99	2548	100	1454	93	1965	94	2008	100
Medora	2278	100	1963	96	2676	99	2604	95	1920	88	1562	104	2170	105	2044	100
Stirling	2438	**106**	2248	101	2774	101	2901	**106**	2450	**114**	1643	**109**	1907	93	1956	94
CDC Striker[1/]	2464	96	2168	97	3106	96	2686	97	2486	97	1434	97	2447	**106**	2698	**107**
Statewide Means	**2481**		**2273**		**2888**		**2876**		**2356**		**1563**		**2209**		**2234**	
Yellow Average	2584		2377		2941		2954		2391		1594		2268		2297	
Green Average	2342		2109		2804		2750		2300		1513		2120		2135	

† - Means for entire trial; Statewide Trial was incorporated into larger trials at different locations.

¶ - Estimation of performance as a comparison of a Variety's Yield to Pea-Type Average Yield (i.e. Yellow, Green), on a yearly basis; Value is the average of the yearly comparisons

1/ - Varieties were not included in the statewide evaluation in 2008, but were tested at Moccasin, Havre and Richland.

DISCLAIMER

The information given herein is supplied with the understanding that no discrimination is intended and no endorsement by the Montana Agricultural Experiment Station is implied. The results of individual traits and studies are considered to be of a **preliminary** nature and should **not** be considered as a product endorsement or recommendation for commercial use. **NOT FOR PUBLICATION**