

2008 North Dakota Alternative Crop Variety Performance

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This publication contains information on selected buckwheat, chickpea, field pea, lentil, proso millet, mustard, safflower and triticale varieties that North Dakota State University tested in 2008. Additional varieties may have been tested but are not listed. Although alternative crops may have been tested across the state, adaptation may be limited to specific regions.

The agronomic data presented in this publication are from replicated research plots using experimental designs that enable the use of statistical analysis. The LSD (least significant difference)

numbers beneath the columns in tables are derived from the statistical analyses and only apply to the numbers in the column in which they appear. If the difference between two varieties exceeds the LSD value, it means that with 95 percent probability the higher-yielding variety has a significant yield advantage. If the difference between two varieties is less than the LSD value, then the variety yields are considered similar. The abbreviation NS is used to indicate no significant difference for that trait among any of the varieties. The CV is a measure of variability in the trial. The CV stands for coefficient of variation and is expressed as a percentage. Large CVs mean a large amount of variation that could not be attributed to differences in the varieties. In the tables, the "mean" indicates the average of the observations in the column.

When selecting a high-yielding and good-quality variety, use data that summarizes several years and locations. Choose the variety that, on average, performs the best at multiple locations near you during several years.

Presentation of data for the entries tested does not imply approval or endorsement by the authors or agencies conducting the test.

Information contained in this publication is based on research coordinated by the following NDSU Research Extension Center and Main Station research agronomists:

*Blaine Schatz and DoKyoung Lee,
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Burton Johnson, Fargo

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Bryan Hanson, Langdon

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Neil Riveland, Williston

Contact NDSU Research Extension Centers or Extension Service offices for more detailed and site-specific information on alternative crop variety performance and production recommendations.

Crop variety data are available in an electronic format at www.ag.ndsu.nodak.edu/aginfo/variety/index.htm.

Weather data are available at <http://ndawn.ndsu.nodak.edu/>.

NDSU

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Buckwheat Variety Trials, 2008

Variety	Seed Yield (lb/a)								
	Location						2008 Average 2 yr 3 yr		
	Langdon	Carrington	Williston	Prosper	Hettinger	Minot			
Koma	1081	359	765	1044	765	2974	1165	1457	1277
Mancan	1358	330	636	1141	649	3011	1188	1461	1346
Manor	953	576	666	1154	762	2372	1081	1440	1321
Mean	1131	422	689	1113	725	2786	1145	1453	1315
LSD 0.05	NS	171	118	NS	NS	470			

Variety	Days to Flower		
	Location		Average
	Williston	Hettinger	
Koma	42	38	40
Mancan	38	36	37
Manor	39	36	38
Mean	40	37	38
LSD 0.05	1	1	

Variety	Plant Height (inches)					
	Location					Average
	Langdon	Carrington	Williston	Prosper	Minot	
Koma	44	42	19	44	40	38
Mancan	46	43	20	44	38	38
Manor	42	45	19	43	35	37
Mean	44	43	20	44	38	38
LSD 0.05	NS	6	NS	NS	NS	

Buckwheat Variety Trials, 2008

Lodging (0-9)¹			
Location			Average
Langdon	Carrington	Prosper	
3.8	1.1	6.8	3.9
3.0	3.0	6.3	4.1
2.5	1.5	6.3	3.4
3.1	1.9	6.5	3.8
NS	NS	NS	

¹Lodging score based on scale 0=all plants upright, 9=flat

Variety	Test Weight (lb/bu)						Average
	Location						
	Langdon	Carrington	Williston	Prosper	Hettinger	Minot	
Koma	43.3	37.3	42.9	40.1	27.8	42.5	39.0
Mancan	43.3	39.7	41.5	38.8	28.6	42.2	39.0
Manor	42.4	38.8	41.1	38.9	31.0	42.4	39.1
Mean	43.0	38.6	41.8	39.3	29.1	42.4	39.0
LSD 0.05	1.5	NS	0.8	0.8	NS	1.2	

Variety	1000 Seed Weight (grams)					Average
	Location					
	Prosper	Williston	Hettinger	Minot		
Koma	27.6	29.0	26.2	28.8	27.9	
Mancan	25.5	27.2	24.2	28.3	26.3	
Manor	26.4	26.7	24.6	27.6	26.3	
Mean	26.5	27.6	25.0	28.2	26.8	
LSD 0.05	1.2	0.9	NS	NS		

Location	Planting Date	Harvest Date
Langdon	May 28	October 1
Carrington	June 5	September 17
Williston	May 20	September 30
Prosper	June 25	October 9
Hettinger	June 9	September 19
Minot	May 28	September 26

Chickpea Variety Trials, 2008

Seed Yield (lb/a)					
Variety	Carrington	Hettinger	Minot	Williston	Average
Kabuli					
Amit (B-90)	2093	2314	1713	1106	2040
CDC Frontier	2382	2112	1713	1116	2069
Dylan	23	1933	494	742	817
HB14	0	1747	957	1107	901
HB19	114	2174	851	927	1046
Sawyer	--	1774	1399	874	1587
Sierra	18	1933	648	769	866
Troy	19	1468	288	461	592
Desi					
CDC Anna	1443	2311	1196	1034	1650
Mean	762	1974	1029	904	1285
CV%	43.6	8.8	39.5	13.9	
LSD 0.05	502	173	245	647	

Days to 10% Flowering					Flowering Duration			
Variety	Carrington	Hettinger	Williston	Average	Variety	Hettinger	Williston	Average
Kabuli					Kabuli			
Amit (B-90)	60	62	50	57	Amit (B-90)	21	14	21
CDC Frontier	60	62	50	57	CDC Frontier	22	14	22
Dylan	62	58	46	55	Dylan	22	16	22
HB14	62	61	48	57	HB14	19	14	19
HB19	61	59	45	55	HB19	23	15	23
Sawyer	--	62	48	55	Sawyer	22	12	22
Sierra	63	62	49	58	Sierra	18	12	18
Troy	62	63	51	59	Troy	19	12	19
Desi					Desi			
CDC Anna	60	61	45	55	CDC Anna	22	16	22
Mean	61	61	48	57	Mean	21	14	21
CV%	1.1	1.7	2.3	--	CV%	6.5	5.1	
LSD 0.05	1	1	2	--	LSD 0.05	2	1	

Chickpea Variety Trials, 2008

Plant Height (inches)				
Variety	Hettinger	Minot	Williston	Average
<i>Kabuli</i>				
Amit (B-90)	16	19	13	16
CDC Frontier	17	19	15	17
Dylan	14	12	11	14
HB14	17	17	15	17
HB19	13	16	12	13
Sawyer	15	16	14	15
Sierra	17	14	13	17
Troy	14	12	11	14
<i>Desi</i>				
CDC Anna	18	15	13	18
Mean	16	16	13	16
CV%	6.7	15.0	11.8	
LSD 0.05	2	4	2	

Test Weight (lb/bu)					
Variety	Carrington	Hettinger	Minot	Williston	Average
<i>Kabuli</i>					
Amit (B-90)	58.9	49.0	59.4	63.7	54.0
CDC Frontier	61.2	50.1	59.7	63.4	55.7
Dylan	NA	47.0	57.1	58.4	47.0
HB14	NA	47.9	59.6	62.8	47.9
HB19	NA	49.0	59.9	60.0	49.0
Sawyer	--	50.8	59.9	62.7	50.8
Sierra	NA	45.1	58.5	61.8	45.1
Troy	NA	44.5	--	58.5	44.5
<i>Desi</i>					
CDC Anna	57.4	41.2	56.3	63.6	49.3
Mean	59.2	47.2	58.8	61.7	49
CV%	1.0	3.4	2.1	1.3	
LSD 0.05	1.0	2.6	2.4	1.9	

Chickpea Variety Trials, 2008

Seeds/lb				
Variety	Carrington	Minot	Williston	Average
<i>Kabuli</i>				
Amit (B-90)	1859	1913	1699	1886
CDC Frontier	1321	1452	1304	1387
Dylan	7560	1094	953	4327
HB14	NA	1321	1027	1321
HB19	1522	1174	940	1348
Sawyer	--	1173	1110	1173
Sierra	3540	1210	1076	2375
Troy	3264	1306	888	2285
<i>Desi</i>				
CDC Anna	2582	2426	2153	2504
Mean	3093	1452	1239	2067
CV%	123.0	9.0	6.0	
LSD 0.05	NS	237	64	

Seed Size (%)¹							
Variety	Minot				Hettinger		
	>10mm	> 9mm	>8mm	<8mm	>9mm	>8mm	<8mm
<i>Kabuli</i>							
Amit (B-90)	0.1	0.3	0.6	99.1	--	--	--
CDC Frontier	0.0	1.6	26.0	72.5	--	--	--
Dylan	10.2	27.1	33.2	29.6	40	42	18
HB14	2.8	16.1	33.6	47.5	41	40	19
HB19	7.1	25.0	30.3	37.6	33	43	24
Sawyer	2.9	13.6	34.5	49.0	19	39	42
Sierra	13.2	28.0	31.4	27.5	32	42	26
Troy	--	--	--	--	58	27	15
<i>Desi</i>							
CDC Anna	0.0	0.0	0.2	99.8	--	--	--
Mean	4.5	14.0	23.7	57.8	37.2	38.8	24.0
CV%	42.1	39.3	15.8	17.6	13.3	21.6	6.8
LSD 0.05	4.2	11.0	6.8	17.0	10	8	8

¹ Seed size data as reported reflect the % of the seed sample remaining on top of the sieves stacked in series.

Chickpea Variety Trials, 2008

1000 Seed Weight (grams)					
Variety	Carrington	Hettinger	Minot	Williston	Average
<i>Kabuli</i>					
Amit (B-90)	244	298	238	267	271
CDC Frontier	345	402	313	348	374
Dylan	145	527	427	476	336
HB14	0	504	344	442	252
HB19	299	521	391	483	410
Sawyer	--	--	390	409	400
Sierra	179	509	393	422	344
Troy	211	556	350	511	384
<i>Desi</i>					
CDC Anna	179	237	188	211	208
Mean	200	444	337	397	331
CV%	34.2	3.9	12.2	2.0	
LSD 0.05	12	26	72	20	

Ascochyta Blight Rating (0-9)¹	
Variety	Minot
<i>Kabuli</i>	
Amit (B-90)	3.0
CDC Frontier	1.3
Dylan	5.0
HB14	3.0
HB19	3.0
Sawyer	2.0
Sierra	2.3
Troy	4.0
<i>Desi</i>	
CDC Anna	2.7
Mean	2.9
CV%	34.3
LSD 0.05	1.8

¹ *Ascochyta* blight rating based on scale 0-9 (0 = no disease, 9 = high disease incidence).

Location	Plant Date	Harvest Date	Previous Crop
Carrington	May 7	September 25	HRSW
Williston	May, 14	August, 20	Fallow
Hettinger	April, 28	August, 15	HRSW
Minot	May, 20	September, 19	Durum

Single or multiple applications of foliar fungicides were applied to manage *ascochyta* blight.

Field Pea Variety Descriptions

Variety	Vine length	Harvest ease	Powdery mildew tolerance	Maturity	Seed size	2008 Average yield among 10 locations (% of DS Admiral)
Yellow						
DS Admiral	medium	good	good	early/med	medium	100
Eclipse	medium	good	good	medium	large	102
CDC Golden	medium	good	good	medium	medium	NA
SW Midas	medium	good	good	early	medium	NA
CDC Mozart	short	fair	good	medium	medium	107
Spider	medium	good	NA	medium	medium	NA
Green						
Arcadia	medium	fair-good	NA	medium	small	NA
Cruiser	medium	fair	poor	medium	small	97
K2	medium	good	good	medium	small	NA
Majoret	medium	fair	poor	medium	medium	106
Matrix	medium	good	good	late	large	NA
CDC Striker	medium	good	poor	medium	medium	104

Field Pea Variety Trials, 2008

Days to First Flower										
Variety	Carring dryland	Minot	Langdon	Hetting	Willist fallow	Willist recrop	Carring irrigated	Dazey	Wishek	Average
Yellow										
CDC Golden	67	57	--	--	--	63	62	66	61	62.5
CDC Mozart	65	56	62	67	63	62	64	66	61	62.8
DS Admiral	66	57	63	67	63	63	64	66	61	63.4
Eclipse	65	57	64	68	64	63	65	68	61	63.7
Spider	67	56	63	67	--	63	--	68	61	63.6
SW Midas	67	--	--	--	64	63	64	67	61	64.3
Green										
Arcadia	66	--	--	--	--	63	--	66	60	63.7
CDC Striker	68	58	64	68	65	67	65	69	62	65.0
Cruiser	65	56	63	66	64	62	64	66	60	62.8
K2	64				61	62	--	66	59	62.4
Majoret	68	59	64	68	65	65	64	68	61	64.4
Matrix	69	59	65	70	--	69	--	69	63	66.3
Mean	66	57	63	68	64	64	64	67	61	63.7
LSD 0.05	1	1	1	1	1	1	1	1	1	

Days to Physiological Maturity								
Variety	Carring dryland	Minot	Langdon	Hetting	Carring irrigated	Dazey	Wishek	Average
Yellow								
CDC Golden	94	78	--	--	103	100	94	94
CDC Mozart	97	82	99	89	106	100	93	95
DS Admiral	97	79	98	89	106	99	93	94
Eclipse	102	82	103	92	111	104	95	98
Spider	97	84	99	--	--	102	93	95
SW Midas	94	--	--	91	104	100	92	96
Green								
Arcadia	96	--	--	--	--	99	92	96
CDC Striker	98	81	101	92	106	102	93	96
Cruiser	98	82	97	90	106	99	91	95
K2	95	--	--	--	--	99	92	95
Majoret	99	83	100	92	105	101	92	96
Matrix	99	83	100	93	--	103	93	95
Mean	97	81	100	91	106	101	93	95
LSD 0.05	2	2	2	1	2	1	2	

Field Pea Variety Trials, 2008

Harvest Ease (0-9¹)								
Variety	Carring dryland	Langdon	Willist fallow	Willist recrop	Carring irrigated	Dazey	Wishek	Average
Yellow								
CDC Golden	4.5	--	--	3.3	8.5	3.5	5.3	5.0
CDC Mozart	6.0	4.8	3.8	7.3	6.0	8.0	6.3	6.0
DS Admiral	3.5	0.5	1.5	2.5	5.3	2.0	5.3	2.9
Eclipse	3.3	3.0	3.8	5.3	4.0	2.3	3.3	3.6
Spider	2.8	1.5	--	2.5	--	3.0	5.5	3.1
SW Midas	3.0	--	2.5	4.5	7.5	1.5	5.8	4.1
Green								
Arcadia	4.5	--	--	5.3	--	3.0	8.0	5.2
CDC Striker	2.0	1.5	1.0	1.8	6.0	1.3	4.8	2.6
Cruiser	4.3	4.8	5.0	4.8	6.3	3.5	7.0	5.1
K2	0.5	--	3.0	3.5		1.8	4.3	2.6
Majoret	3.0	5.8	5.0	6.3	6.8	3.0	7.0	5.3
Matrix	3.5	2.5	--	4.3	--	3.3	5.5	3.8
Mean	3.4	3.1	3.2	4.3	6.3	3.0	5.7	4.1
LSD 0.05	1.6	2.4	0.7	1.3	1.5	2.0	1.5	

¹0=all plants upright/very easy harvest, 9=all plants flat/very difficult to direct harvest.

Location	Planting date	Harvest date
Carrington - dryland	April 23	August 13
Carrington - irrigated	April 25	August 14
Dazey	April 23	August 7
Hettinger	April 23	July 31
Langdon	April 30	September 10
Minot	May 8	August 8
Williston -Fallow	April 22	July 30
Williston Re-Crop	April 22	July 30
Wilton	April 22	August 12
Wishek	April 30	August 6

Field Pea Variety Trials, 2008

Seed Yield (bu/a)											
Variety	Carring dryland	Minot	Langdon	Wilton	Hetting	Willist fallow	Willist recrop	Carring irrigated	Dazey	Wishek	Average
Yellow											
CDC Golden	65.1	43.0	--	--	--	--	9.9	96.9	82.6	65.2	60.5
CDC Mozart	60.8	37.1	69.5	42.3	46.6	25.2	10.6	77.5	78.0	56.6	50.4
DS Admiral	56.3	29.7	66.9	42.3	41.6	26.5	11.0	53.4	76.5	66.4	47.1
Eclipse	54.7	37.9	74.9	45.8	37.5	24.5	9.9	60.2	66.2	67.0	47.9
Spider	65.6	36.7	78.4	40.8	38.6	--	9.9	--	81.4	60.0	51.4
SW Midas	55.8	--	--	42.8	--	27.4	10.7	80.6	77.5	64.7	51.4
Green											
Arcadia	64.5	--	--	39.8	--	--	11.9	--	87.9	72.4	55.3
CDC Striker	60.2	38.2	72.8	43.5	38.1	24.4	7.6	75.6	74.6	54.3	48.9
Cruiser	55.4	28.5	59.5	41.4	36.4	21.0	10.0	78.4	74.6	49.7	45.5
K2	61.1	--	--	39.5	--	23.9	11.3	--	78.2	56.0	45.0
Majoret	66.1	36.6	73.6	36.3	41.3	21.7	8.0	83.1	78.2	51.7	49.7
Matrix	67.8	31.5	70.1	43.9	38.5	--	7.5	--	76.9	54.0	48.8
Mean	61.1	35.5	70.7	41.7	39.8	24.3	9.9	75.7	77.7	59.8	50.1
LSD 0.05	6.0	7.3	5.5	6.6	3.5	3.3	2.4	9.4	6.8	NS	

1000 Seed Weight (grams)											
Variety	Carring dryland	Minot	Langdon	Wilton	Hetting	Willist fallow	Willist recrop	Carring irrigated	Dazey	Wishek	Average
Yellow											
CDC Golden	206	205	--	--	--	--	176	215	209	212	203.7
CDC Mozart	231	229	240	228	197	209	184	252	221	234	222.5
DS Admiral	237	227	244	254	197	235	220	261	242	241	235.8
Eclipse	237	250	284	265	188	234	193	280	241	233	240.5
Spider	239	241	284	246	224	--	191	--	247	247	239.8
SW Midas	206	--	--	213	--	192	177	216	195	210	201.3
Green											
Arcadia	195	--	--	211	--	--	156	--	201	210	194.6
CDC Striker	244	228	264	220	205	212	194	261	244	237	230.9
Cruiser	202	199	224	233	197	195	171	217	201	202	204.1
K2	213	--	--	225	--	206	193	--	212	220	211.5
Majoret	214	222	220	255	167	210	173	226	208	213	210.8
Matrix	268	261	296	267	215	--	217	--	274	260	257.3
Mean	224	229	257	238	199	212	187	241	225	227	221.1
LSD 0.05	11	12	--	14	22	6	14	7	7	8	

Field Pea Variety Trials, 2008

Test Weight (lb/bu)											
Variety	Carring dryland	Minot	Langdon	Wilton	Hetting	Willist fallow	Willist recrop	Carring irrigated	Dazey	Wishek	Average
Yellow											
CDC Golden	63.6	64.7	--	--	--	--	65.0	63.5	65.1	65.1	64.5
CDC Mozart	63.8	64.6	62.6	61.2	61.4	65.2	64.5	63.7	64.8	65.8	63.8
DS Admiral	63.7	64.4	62.7	60.4	59.8	64.7	64.0	64.1	65.4	64.7	63.4
Eclipse	64.5	64.7	62.4	61.2	55.9	65.2	64.4	64.8	65.9	65.6	63.5
Spider	64.0	63.4	62.9	62.0	59.0	--	64.1	--	65.8	65.8	63.4
SW Midas	63.5	--	--	61.2	--	65.6	64.6	64.0	64.7	64.4	64.0
Green											
Arcadia	62.8	--	--	61.2	--	--	63.3	--	64.8	64.9	63.4
CDC Striker	64.2	64.5	63.8	62.0	59.3	65.5	64.3	64.2	65.5	65.4	63.9
Cruiser	63.3	62.7	61.9	61.2	59.4	63.8	63.2	63.3	65.4	64.0	62.8
K2	63.6	--	--	62.0	--	64.6	64.9		64.6	65.1	64.1
Majoret	63.4	63.7	62.1	62.0	58.6	64.7	64.2	63.9	64.8	64.6	63.2
Matrix	63.8	63.6	61.9	60.8	58.3	--	64.6	--	64.9	64.8	62.8
Mean	63.7	64.0	62.5	61.4	59.0	64.9	64.3	63.9	65.1	65.0	63.6
LSD 0.05	0.7	1.0	0.5	--	1.7	0.9	0.9	0.6	0.7	0.7	

Seed Protein (%)									
Variety	Carring dryland	Minot	Langdon	Willist fallow	Willist recrop	Carring irrigated	Dazey	Wishek	Average
Yellow									
CDC Golden	24.7	24.6	--	--	26.3	24.5	24.5	23.9	24.8
CDC Mozart	23.8	23.7	23.5	24.5	25.1	23.5	23.4	23.2	23.8
DS Admiral	23.5	24.5	23.8	23.3	24.9	24.3	24.2	23.7	24.0
Eclipse	24.8	24.5	24.6	24.5	25.1	24.6	24.8	24.8	24.7
Spider	24.6	25.1	24.3		25.9	--	24.4	24.1	24.7
SW Midas	24.0	--	--	23.4	25.3	24.1	23.5	23.3	23.9
Green									
Arcadia	24.0	--	--	--	26.2	--	23.6	23.6	24.4
CDC Striker	24.8	25.2	25.0	24.8	26.4	25.4	24.6	24.6	25.1
Cruiser	24.1	24.1	24.6	23.9	25.4	24.4	24.2	24.2	24.4
K2	24.0	--	--	24.2	24.9	--	24.0	23.4	24.1
Majoret	25.2	24.2	24.5	24.5	26.0	24.3	24.5	24.0	24.7
Matrix	23.4	23.4	23.2	--	24.2	--	23.0	22.9	23.4
Mean	24.2	24.4	24.2	24.1	25.5	24.4	24.1	23.8	24.3
LSD 0.05	0.5	0.7	0.7	NS	1.1	0.5	0.4	0.6	

Lentil Variety Descriptions ¹					
Variety	Cotyledon color	Plant height	Seed size	Maturity	2008 Average yield among five locations (% of Richlea)
CDC Meteor	green	medium	large	medium	91
Pennell	green	medium	extra large	medium	98
CDC Plato	green	medium	large	med/late	90
CDC Richlea	green	medium	medium	medium	100
Riveland	green	short	large	medium	81
CDC Viceroy	green	tall	small	early/med	108
Crimson	red	short	small	early	NA
CDC Rouleau	red	tall	small	medium	107

¹References include 'Manitoba Seed - 2009'.

Lentil Variety Trials, 2008

Seed Yield (lb/a)							
Variety	Seed Size	Carrington	Hettinger	Minot	Williston Fallow	Williston Burke	Average
French Green							
CDC LeMay	Small	1982	1294	--	--	--	1638
Green							
CDC Greenland	Large	2570	1315	1733	--	--	1873
CDC Impress-CL	Medium	2561	1364	1474	--	--	1800
CDC Improve-CL	Large	2934	985	1391	--	--	1770
CDC Meteor	Large	2320	1205	1316	502	1206	1310
CDC Plato	Large	2329	1063	1083	524	1479	1296
CDC Richlea	Medium	2638	1355	1285	427	1460	1433
CDC Viceroy	Small	2595	1295	1511	581	1741	1545
Pennell	Ext Large	2317	1095	1282	481	1816	1398
Riveland	Large	1962	1098	928	447	1369	1161
Red							
CDC Blaze	Small	--	--	--	468	1388	928
CDC Impact-CL	Small	2251	537	1328	--	--	1372
CDC Impala-CL	Very Small	2355	729	1382	--	--	1489
CDC Imperial-CL	Very Small	2162	758	1145	--	--	1355
CDC Maxim-CL	Small	2710	1227	1870	--	--	1936
CDC Robin	Small	--	--	--	354	--	--
CDC Rosetown	Very Small	2525	851	1879	--	--	1752
CDC Rouleau	Small	2726	1247	1962	344	1419	1540
Crimson	Small	1979	939	945	482	--	1086
Zero Tannin							
Cedar (<i>red</i>)	Medium	1738	816	1082	--	--	1212
Shasta (<i>yellow</i>)	Medium	1882	906	897	271	--	989
Mean		2344	1057	1361	444	1485	1444
CV%		9.1	13.2	24.7	20.0	11.0	
LSD 0.05		303	197	589	134	293	

Lentil Variety Trials, 2008

Days to 10% Flowering					
Variety	Carrington	Hettinger	Minot	Williston Fallow	Average
French Green					
CDC LeMay	57	62	--	--	60
Green					
CDC Greenland	58	62	55	--	58
CDC Impress-CL	57	62	54	--	58
CDC Improve-CL	56	62	54	--	57
CDC Meteor	59	62	56	61	60
CDC Plato	60	63	58	62	61
CDC Richlea	58	62	58	62	60
CDC Viceroy	58	63	57	61	60
Pennell	58	63	56	61	60
Riveland	57	60	56	58	58
Red					
CDC Blaze	--	--	--	59	59
CDC Impact-CL	58	60	55	--	58
CDC Impala-CL	58	62	55	--	58
CDC Imperial-CL	57	62	55	--	58
CDC Maxim-CL	57	60	54	--	57
CDC Robin	--	--	--	58	58
CDC Rosetown	58	62	56	--	59
CDC Rouleau	58	61	57	60	59
Crimson	56	62	56	58	57
Zero Tannin					
Cedar	56	59	55	--	57
Shasta	57	59	55	58	57
Mean	58	61	56	60	58
CV%	1.1	1.8	2.1	2.0	
LSD 0.05	1	1	2	2	

Lentil Variety Trials, 2008

Plant Height (inches)						
Variety	Carrington	Hettinger	Minot	Williston Fallow	Williston Burke	Average
French Green						
CDC LeMay	12	12	--	--	--	12
Green						
CDC Greenland	11	11	13	--	--	12
CDC Impress-CL	13	11	14	--	--	13
CDC Improve-CL	14	14	14	--	--	14
CDC Meteor	13	11	13	11	15	13
CDC Plato	12	12	14	11	14	13
CDC Richlea	12	10	14	10	14	12
CDC Viceroy	14	10	12	10	12	11
Pennell	12	10	12	10	12	11
Riveland	10	14	13	10	14	13
Red						
CDC Blaze	--	--	--	7	12	10
CDC Impact-CL	13	10	10	--	--	10
CDC Impala-CL	14	10	10	--	--	10
CDC Imperial-CL	13	10	11	--	--	11
CDC Maxim-CL	13	10	13	--	--	12
CDC Robin	--	--	--	8	--	8
CDC Rosetown	15	9	12	--	--	11
CDC Rouleau	14	9	13	9	13	11
Crimson	11	10	11	8	--	10
Zero Tannin						
Cedar	12	11	12	--	--	12
Shasta	13	12	14	10	--	12
Mean	13	11	13	9	13	11
CV%	9.6	13.6	9.7	12.0	9.0	
LSD 0.05	2	2	2	2	2	

Lentil Variety Trials, 2008

Days to Physiological Maturity				
Variety	Carrington	Hettinger	Minot	Average
French Green				
CDC LeMay	86	92	--	89
Green				
CDC Greenland	91	92	83	92
CDC Impress-CL	90	92	80	91
CDC Improve-CL	92	93	81	93
CDC Meteor	91	93	85	92
CDC Plato	94	94	85	94
CDC Richlea	91	93	83	92
CDC Viceroy	90	91	83	91
Pennell	90	91	83	91
Riveland	92	93	85	93
Red				
CDC Impact-CL	88	92	79	90
CDC Impala-CL	90	94	79	92
CDC Imperial-CL	89	92	78	91
CDC Maxim-CL	90	92	81	91
CDC Rosetown	89	91	81	90
CDC Rouleau	91	92	85	92
Crimson	85	90	81	88
Zero Tannin				
Cedar	92	93	84	93
Shasta	94	94	84	94
Mean	90	92	82	91
CV%	1.6	1.0	1.5	
LSD 0.05	2	1	2	

Location	Planting Date	Harvest Date	Previous Crop
Carrington	May 5	August 18	HRSW
Hettinger	April 28	August 11	HRSW
Minot	May 8	August 29	Durum
Williston-Fallow	April 29	August 5	Fallow
Williston-Burke County	May 6	August 20	Fallow

Lentil Variety Trials, 2008

Test Weight (lb/bu)					
Variety	Carrington	Minot	Williston Fallow	Williston Burke	Average
French Green					
CDC LeMay	60.3	--	--	--	60.3
Green					
CDC Greenland	56.6	56.8	--	--	56.7
CDC Impress-CL	59.1	58.4	--	--	58.8
CDC Improve-CL	58.3	58.2	--	--	58.3
CDC Meteor	59.4	60.2	61.2	61.6	60.6
CDC Plato	57.7	58.1	59.6	60.2	58.9
CDC Richlea	58.5	59.2	60.1	60.8	59.7
CDC Viceroy	60.6	62.5	62.8	63.8	62.4
Pennell	57.2	57.3	58.5	60.2	58.3
Riveland	56.5	56.9	58.4	59.0	57.7
Red					
CDC Blaze	--	--	64.0	62.9	63.5
CDC Impact-CL	60.9	61.5	--	--	61.2
CDC Impala-CL	61.2	62.4	--	--	61.8
CDC Imperial-CL	59.6	60.5	--	--	60.1
CDC Maxim-CL	60.3	61.7	--	--	61.0
CDC Robin	--	--	63.5	--	63.5
CDC Rosetown	60.2	62.8	--	--	61.5
CDC Rouleau	60.3	61.3	61.7	62.8	61.5
Crimson	61.6	61.9	62.4	--	62.0
Zero Tannin					
Cedar	56.7	59.5	--	--	58.1
Shasta	57.0	59.2	61.1	--	59.1
Mean	59.1	59.9	61.2	61.4	60.2
CV%	0.6	1.2	0.5	1.0	
LSD 0.05	0.5	1.1	0.7	1.4	

Lentil Variety Trials, 2008

1000 Seed Weight (grams)						
Variety	Carrington	Hettinger	Minot	Williston Fallow	Williston Burke	Average
French Green						
CDC LeMay	31.6	48.0	--	--	--	39.8
Green						
CDC Greenland	66.2	68.4	68.3	--	--	67.6
CDC Impress-CL	51.6	55.0	51.0	--	--	52.5
CDC Improve-CL	72.2	72.7	73.0	--	--	72.6
CDC Meteor	51.2	49.8	54.3	54.0	53.0	51.8
CDC Plato	62.2	69.8	67.0	64.0	69.0	66.3
CDC Richlea	53.1	55.4	51.9	55.0	56.0	53.5
CDC Viceroy	31.7	39.4	34.1	36.0	35.0	35.1
Pennell	71.3	66.6	71.9	71.0	76.0	69.9
Riveland	75.2	74.4	75.2	78.0	85.0	74.9
Red						
CDC Blaze	--	--	--	39.0	39.0	39.0
CDC Impact-CL	35.8	43.4	34.0	--	--	37.7
CDC Impala-CL	28.2	38.8	28.8	--	--	31.9
CDC Imperial-CL	28.0	39.3	27.6	--	--	31.6
CDC Maxim-CL	40.5	46.2	38.5	--	--	41.7
CDC Robin	--	--	--	31.0	42.0	36.5
CDC Rosetown	30.0	37.8	30.0	--	32.6	32.6
CDC Rouleau	37.6	45.2	37.9	43.0	--	40.9
Crimson	36.3	39.6	35.0	39.0	--	37.5
Zero Tannin						
Cedar	47.7	55.2	47.8	--	--	50.2
Shasta	57.7	65.0	62.2	61.0	--	61.5
Mean	47.8	53.2	49.4	51.9	54.2	48.8
CV%	3.7	4.1	4.8	1.0	6.0	
LSD 0.05	2.5	2.1	3.9	1.0	8.0	

Mustard Variety Trials, 2008

Variety		Seed Yield (lb/a)								
		Location						2008 Average	2 yr Average	3 yr Average
		Langdon	Carrington	Williston	Prosper	Minot	Hettinger			
Type										
AC Pennant	Yellow	1777	901	521	1122	1198	510	1005	1025	1064
Ace	Yellow	1951	1096	607	1261	1858	452	1204	1108	1125
Andante	Yellow	2146	891	579	1435	1820	681	1259	1176	1193
Tilney	Yellow	2004	746	704	1289	1702	619	1177	1162	1131
Forge	Oriental	2361	751	738	1703	1008	1137	1283		
Common	Brown	2106	1053	762	1498	1465	1208	1349		
Duchess	Brown	2278	990	766	1603	1656	1168	1410		
Mean		2089	917	668	1422	1530	825	1241	1118	1128
LSD 0.05		325	106	NS	185	NS	267			

Variety		Days to Flower					
		Location					Average
		Langdon	Williston	Prosper	Minot	Hettinger	
Type							
AC Pennant	Yellow	47	60	38	47	55	49
Ace	Yellow	47	61	40	45	54	49
Andante	Yellow	47	61	38	45	53	49
Tilney	Yellow	47	61	37	45	54	49
Forge	Oriental	51	66	45	51	60	55
Common	Brown	51	63	45	49	59	53
Duchess	Brown	50	64	45	50	60	54
Mean		49	62	41	47	56	51
LSD 0.05		1	NA	2	2	1	

Mustard Variety Trials, 2008

Variety		Days to Mature				
		Location				Average
		Langdon	Carrington	Minot	Hettinger	
Type						
AC Pennant	Yellow	91	92	75	84	86
Ace	Yellow	93	92	76	84	86
Andante	Yellow	92	93	76	83	86
Tilney	Yellow	93	93	75	83	86
Forge	Oriental	95	86	76	90	87
Common	Brown	95	89	75	89	87
Duchess	Brown	95	88	76	90	87
Mean		93	90	76	86	86
LSD 0.05		2	4	NS	1	

Variety		Flower Duration (Days)					Lodging (0-9)			
		Location				Average	Location			Average
		Langdon	Minot	Prosper	Hettinger		Carrington	Prosper	Hettinger	
Type										
AC Pennant	Yellow	21	20	36	20	24	0	0	2	1
Ace	Yellow	22	20	35	20	24	0	0	5	2
Andante	Yellow	22	18	37	21	24	0	0	4	1
Tilney	Yellow	22	20	37	21	25	0	0	6	2
Forge	Oriental	26	15	28	18	22	1	2	6	3
Common	Brown	23	15	28	18	21	1	1	1	1
Duchess	Brown	24	15	28	18	21	1	0	1	1
Trial Mean		23	18	33	19	23	1	0	4	1
LSD 0.05		1	3	2	1		1	NS	3	

Variety		Plant Height (inches)						
		Location						Average
		Langdon	Carrington	Williston	Prosper	Minot	Hettinger	
Type								
AC Pennant	Yellow	42	31	28	31	30	41	34
Ace	Yellow	44	33	26	32	37	37	35
Andante	Yellow	43	28	30	32	33	42	35
Tilney	Yellow	43	28	27	37	32	40	34
Forge	Oriental	52	39	41	45	39	46	44
Common	Brown	48	36	38	40	37	46	41
Duchess	Brown	49	36	35	39	39	47	41
Mean		46	33	32	36	35	43	38
LSD 0.05		3	8	NS	3	4	NS	

Mustard Variety Trials, 2008

Variety	Type	Oil (%)				Test Weight (lb/bu)				
		Location			Average	Location				Average
		Williston	Minot	Carrington		Minot	Carrington	Williston	Prosper	
AC Pennant	Yellow	28.3	19.9	19.7	22.6	54.2	55.8	56.5	55.8	55.6
Ace	Yellow	28.5	19.9	19.9	22.8	54.0	55.8	56.0	55.9	55.4
Andante	Yellow	27.3	19.9	19.8	22.3	54.5	55.8	56.6	55.7	55.7
Tilney	Yellow	28.6	19.9	19.8	22.8	52.2	55.8	56.2	55.2	54.9
Forge	Oriental	34.7	20.1	19.8	24.9	52.4	53.2	53.7	53.3	53.2
Common	Brown	34.2	20.1	19.8	24.7	52.2	53.1	53.9	52.9	53.0
Duchess	Brown	34.2	20.1	19.9	24.7	52.2	52.8	53.3	52.5	52.7
Mean		30.8	20.0	19.8	23.5	53.4	54.7	55.2	54.4	54
LSD 0.05		NS	NS	NS		1.8	0.6	NS	0.3	

Location	Planting Date	Harvest Date
Langdon	May 8	August 19
Carrington	May 13	--
Hettinger	April 23	July 30
Prosper	May 14	August 26
Minot	May 15	August 26
Williston	April 18	Aug 1 for Brown & Oriental Aug 6 for Yellow

Proso Millet Variety Trials, 2008

<u>Grain Yield (lb/a)</u>					
Variety	Hettinger	Carrington	Williston	Prosper	Average
Horizon	1347	1085	1001	2039	1368
Sunrise	1377	331	406	1820	984
Sunup	1401	882	575	2119	1244
Red Waxy	477	589	207	--	424
CV %	11	39	7	13	
LSD 0.05	199	491	58	NS	

<u>Test Weight (lb/bu)</u>					
Variety	Hettinger	Carrington	Williston	Prosper	Average
Horizon	50.5	55.0	52.2	52.9	52.6
Sunrise	50.5	53.7	52.8	51.7	52.2
Sunup	52.1	54.0	51.5	52.8	52.6
Red Waxy	45.7	47.0	38.7	--	43.8
CV %	2.4	1.1	1.2	1.3	
LSD 0.05	1.9	0.9	1.9	NS	

<u>Plant Height (inches)</u>				
Variety	Carrington	Williston	Prosper	Average
Horizon	39	15	49	34
Sunrise	39	17	48	35
Sunup	44	20	51	38
Red Waxy	54	25	--	40
CV %	6.7	5	3	
LSD 0.05	5	2	NS	

----- <u>Days to Head</u> ¹ -----					
Variety	Hettinger	Carrington	Williston	Prosper	Average
Horizon	68	64	66	47	61
Sunrise	67	64	64	47	61
Sunup	69	62	64	47	61
Red Waxy	77	75	75	--	
CV %	0.5	0.9	1	0	
LSD 0.05	1	1	1	NS	

¹ Days to Head: number of days from planting to head emergence from the boot.

	Hettinger	Carrington	Williston	Prosper
Planting Date	June 9	June 5	June 5	June 25
Harvest Date	Sept. 29	Sept. 17	Oct. 10	Oct. 9

Safflower Variety Trials, 2008

Seed Yield (lb/a)									
Variety	Minot fallow	Hettinger no-till	Carrington recrop	--- Williston --- recrop	--- Williston --- fallow	---- Sidney, MT ---- fallow	---- Sidney, MT ---- irrigated	---- Sidney, MT ---- recrop	8 location average
Oleic									
Montola 2003	2564	1141	2189	178	886	1241	2344	405	1369
Montola 2000	2059	1474	1763	325	862	1276	2499	627	1361
Mon-Dak	2310	1386	2269	401	1068	1405	3060	553	1557
Hybrid 9049	2833	1665	2016	459	1238	1528	2943	592	1659
Hybrid 1601	3510	1637	1863	434	1302	1704	3720	611	1848
MT 6081	2921	1314	2547	504	928	1317	2608	641	1598
MT 7113	2350	1307	1717	365	1130	1386	2132	312	1337
Linoleic									
Finch	2165	1357	1992	377	1070	1335	2448	617	1420
Nutrasaff	1679	612	1939	273	834	1167	2129	533	1146
Cardinal	2836	1377	2204	326	1279	1385	2695	510	1576
S-541	2359	1071	2147	352	--	--	--	--	--
MT 1286	2204	1484	2232	452	1049	1333	2453	355	1445
Mean	2483	1319	2073	403	991	1344	2548	567	1483
LSD 0.05	518	147	450	220	138	170	499	NS	

Plant Height (inches)									
Variety	Minot fallow	Hettinger no-till	Carrington recrop	--- Williston --- recrop	--- Williston --- fallow	---- Sidney, MT ---- fallow	---- Sidney, MT ---- irrigated	---- Sidney, MT ---- recrop	6 location average
Oleic									
Montola 2003	27	27	26.7	11.4	17.1	11.1	16.9	12.2	18.7
Montola 2000	24	25	24.9	11.6	15.7	16.0	15.9	12.2	18.2
Mon-Dak	27	28	28.0	12.9	18.6	17.6	19.6	12.3	20.5
Hybrid 9049	28	27	27.7	12.4	20.0	20.4	18.2	14.3	21.0
Hybrid 1601	29	28	30.1	13.6	20.3	20.4	21.8	14.1	22.1
MT 6081	28	26	27.7	12.9	18.0	16.1	16.3	14.2	19.9
MT 7113	27	24	25.0	11.5	17.2	17.8	16.8	10.2	18.7
Linoleic									
Finch	29	29	28.8	12.2	17.6	17.8	17.7	13.0	20.6
Nutrasaff	25	30	29.1	11.9	20.0	18.8	16.9	15.4	20.9
Cardinal	31	31	30.7	13.1	20.4	18.4	18.0	12.6	21.9
S-541	30	28	28.7	14.1	--	--	--	--	--
MT 1286	31	28	29.1	13.8	18.1	18.1	19.0	11.4	21.1
Mean	28	28	28.0	12.9	17.9	17.5	17.9	12.9	20.3
LSD 0.05	NS	2	1.7	NS	2.2		2.7	3.5	

Safflower Variety Trials, 2008

Test Weight (lb/bu)									
Variety	Minot fallow	Hettinger no-till	Carrington recrop	--- Williston --- recrop	--- Williston --- fallow	----- Sidney, MT ----- fallow	----- Sidney, MT ----- irrigated	----- Sidney, MT ----- recrop	8 location average
Oleic									
Montola 2003	38.2	38.6	36.8	41.7	41.6	42.8	39.0	43.2	40.2
Montola 2000	36.3	36.1	36.3	41.0	39.8	42.5	41.0	42.8	39.5
Mon-Dak	39.6	38.3	34.7	42.4	42.7	43.7	39.5	44.0	40.6
Hybrid 9049	38.0	42.8	39.1	43.5	45.5	46.5	42.0	45.3	42.8
Hybrid 1601	37.5	40.4	36.8	40.5	41.3	42.5	39.3	41.2	39.9
MT 6081	37.5	38.3	38.4	42.3	42.7	43.7	40.0	43.7	40.8
MT 7113	36.2	32.1	38.3	37.5	39.0	39.8	38.3	40.0	37.7
Linoleic									
Finch	38.3	41.6	38.0	42.8	44.5	45.2	42.0	45.2	42.2
Nutrasaff	33.9	32.5	38.3	38.2	37.6	38.5	37.8	38.2	36.9
Cardinal	39.7	43.0	39.4	42.6	44.5	45.2	41.5	45.5	42.7
S-541	34.5	37.1	37.9	41.6	--	--	--	--	--
MT 1286	36.1	37.6	37.1	40.8	41.1	42.2	39.0	41.8	39.5
Mean	37.1	38.2	37.6	40.7	40.2	42.6	39.4	42.6	40.3
LSD 0.05	2.0	1.1	2.4	1.1	4.9	0.6	1.3	0.9	

Seed Oil (%)									
Variety	Minot fallow	Hettinger no-till	Carrington recrop	--- Williston --- recrop	--- Williston --- fallow	----- Sidney, MT ----- fallow	----- Sidney, MT ----- irrigated	----- Sidney, MT ----- recrop	8 location average
Oleic									
Montola 2003	34.0	38.0	32.9	34.0	35.7	37.8	39.8	36.8	36.1
Montola 2000	34.5	40.2	38.6	36.5	36.2	38.5	32.0	38.1	36.8
Mon-Dak	33.0	37.6	34.7	33.2	33.9	36.0	36.3	35.4	35.0
Hybrid 9049	26.7	32.3	32.3	30.6	30.1	30.7	38.3	30.4	31.4
Hybrid 1601	34.2	37.4	37.3	34.4	34.4	35.9	38.3	35.7	35.9
MT 6081	32.9	38.6	30.2	35.8	35.4	37.4	36.9	36.5	35.5
MT 7113	39.8	41.8	38.2	39.9	38.9	41.0	40.8	39.2	39.9
Linoleic									
Finch	33.0	35.6	33.6	34.9	35.9	36.6	38.1	36.0	35.5
Nutrasaff	41.4	42.7	30.0	45.1	45.8	46.9	49.8	47.0	43.6
Cardinal	32.6	34.6	32.6	33.5	34.9	35.8	37.4	35.2	34.6
S-541	34.7	41.2	32.7	40.5	--	--	--	--	--
MT 1286	34.7	37.7	33.7	37.8	38.7	38.7	41.0	38.5	37.6
Mean	34.3	38.1	33.9	36.9	38.1	38.4	39.5	37.7	36.5
LSD 0.05	1.5	1.0	NS	1.0	0.7	1.0	2.5	1.2	

Safflower Variety Trials, 2008

Location	Plant Date	Harvest Date
Hettinger	April 28	September 5
Minot	May 14	October 3
Carrington	May 7	October 1
Williston Fallow	April 25	September 10
Williston Recrop	May 5	August 5
Sidney Fallow	May 7	September 11
Sidney Recrop	April 30	September 18
Sidney Irrigated	May 15	October 1

Triticale Variety Trials, 2008

Yield (bu/a)								
Variety	Carrington	Hettinger	Minot	Williston	----- Average -----			
					2008	2007	2006	3 year
Companion	59.0	46.6	68.7	35.3	58.1	40.8	52.3	50.4
Laser	58.7	48.4	66.0	34.2	57.7	44.0	47.0	49.6
Marvel	58.0	46.5	73.5	34.7	59.3	34.0	40.3	44.5
RSI 310	69.9	58.5	83.3	45.9	70.6	52.9	54.7	59.4
Trical 2700	62.2	51.9	79.9	35.0	64.7	38.8	51.6	51.7
Wapiti	62.9	45.1	65.2	34.7	57.7	38.8	49.9	48.8
Mean	61.7	46.9	72.8	36.6	54.5	40.8	63.4	50.7
CV%	5.5	8.7	11.8	5.9	8.0	10.5		
LSD 0.05	5.2	6.2	13.0	3.2	6.9	6.0	5.3	

Days to Head					
Variety	Carrington	Hettinger	Minot	Williston	Average
Companion	69	74	63	57	66
Laser	71	76	63	56	67
Marvel	71	77	63	58	67
RSI 310	67	74	60	56	64
Trical 2700	75	79	65	62	70
Wapiti	70	75	63	57	66
Mean	71	76	63	58	66.7
CV%	0.7	1.2	0.5	1.0	
LSD 0.05	1	1	1	1	

Plant Height (inches)					
Variety	Carrington	Hettinger	Minot	Williston	Average
Companion	39	46	48	42	45
Laser	33	48	46	41	45
Marvel	34	48	42	38	43
RSI 310	41	46	38	34	39
Trical 2700	38	45	45	39	43
Wapiti	36	49	47	41	46
Mean	37	47	44	39	43
CV%	12.4	5.5	5.0	4.0	
LSD 0.05	7	NS	3	2	

Triticale Variety Trials, 2008

Plant Lodge (0-9)¹				
Variety	Carrington	Hettinger	Minot	Average
Companion	2.3	1.2	4.8	2.8
Laser	1.5	1.2	5.5	2.7
Marvel	0.0	2.2	4.0	2.1
RSI 310	0.0	0.8	2.0	0.9
Trical 2700	0.0	1.8	2.8	1.5
Wapiti	2.0	1.5	4.3	2.6
Mean	1.0	41.5	3.9	2.1
CV%	79.1	55.9	29.4	
LSD 0.05	1.1	NS	1.7	

¹ Lodging score based on scale 0 = upright, 9 = flat.

Test Weight (lb/bu)					
Variety	Carrington	Hettinger	Minot	Williston	Average
Companion	54.5	40.6	55.0	52.1	50.6
Laser	55.1	44.0	55.0	53.4	51.9
Marvel	47.6	37.2	49.0	45.0	44.7
RSI 310	52.6	45.4	52.3	50.6	50.2
Trical 2700	49.1	37.8	50.2	47.5	46.2
Wapiti	54.5	40.8	54.7	52.1	50.5
Mean	52.2	41.0	52.7	50.1	49.0
CV%	1.0	5.3	1.0	1.6	
LSD 0.05	0.8	5.3	0.8	0.8	

1000 Seed Weight (grams)			
Variety	Minot	Williston	Average
Companion	44.5	31.2	37.9
Laser	44.8	28.5	36.7
Marvel	38.9	23.9	31.4
RSI 310	36.9	27.9	32.4
Trical 2700	41.1	25.8	33.5
Wapiti	43.4	27.8	35.6
Mean	41.6	27.5	34.6
CV%	4.2	8.5	
LSD 0.05	2.6	NS	

Location	Planting Date	Harvest Date	Previous Crop
Carrington	April 16	August 15	Soybean
Hettinger	April 14	August 1	Durum
Minot	May 2	August 27	Fallow
Williston	April 30	August 19	Fallow

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