A-1105 (Revised)

2011 North Dakota Alternative Crop Variety Performance

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This publication contains information on selected varieties of flax, safflower, lentil and chickpea that North Dakota State University tested in 2011. Challenging weather and soil conditions significantly reduced acres of these crops in 2011 (Table 1). Additional varieties of these crops or other alternative crops 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.

Table 1. Crop acres[1], North Dakota, 2009-11.

Crop	2011	2010	2009
Flax	148,200	381,510	286,060
Safflower	2,380	15,230	19,280
Lentil	74,705	260,260	161,930
Chickpea	3,980	15,630	19,830

[1] Farm Service Agency reported acreage.

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 that no significant difference was found 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 conducting the test.

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

Blaine Schatz, Tim Indergaard, Steve Schaubert and Bob Smith – Carrington

Glenn Martin – Dickinson

Kevin McPhee and James Hammond – Fargo

Eric Eriksmoen and Rick Olson – Hettinger

Bryan Hanson and Richard Wilhelmi – Langdon

Shana Pederson, Angela Sebelius and James Tarasenko – Minot

Jerry Bergman, Gordon Bradbury, Sara Loomer, Tyler Tjelde and Cameron Wahlstrom – 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 in an electronic format are available at *www.ag.ndsu.edu/varietytrials.*

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

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Table 2. Flax Variety Descriptions.

Variety[1]	Origin[2]	Year Released	Relative Maturity	Seed Color	Plant Height	Wilt[3]
AC Lightning	Can.	2002	Late	Brown	Med.tall	R
Bison	ND	1926	Med.	Brown	Med.	MR
Carter	ND	2004	Med.	Yellow	Med.	R
Cathay	ND	1998	Med.	Brown	Med.	MR
CDC Arras	Can.	1999	Med.	Brown	Med.	MR
CDC Bethune	Can.	1999	Med.late	Brown	Med.tall	MR
CDC Mons	Can.	2003	Med.late	Brown	Med.	MR
CDC Sorrel	Can.	2007	Med.late	Brown	Med.tall	MR
Hanley	Can.	2002	Med.early	Brown	Med.	R
Linott	Can.	1966	Med.early	Brown	Med.	MS/MR
McGregor	Can.	1980	Late	Brown	Med.tall	MR
Neche	ND	1988	Med.	Brown	Med.	R
Nekoma	ND	2002	Late	Brown	Med.	MR
Omega	ND	1989	Med.	Yellow	Med.	MS
Pembina	ND	1998	Med.	Brown	Med.	MR
Prairie Blue	Can.	2003	Med.late	Brown	Med.tall	MR
Prairie Grande	Can.	2008	Med.early	Brown	Med.	MR
Prairie Thunder	Can.	2006	Med.	Brown	Short	MR
Rahab 94	SD	1994	Med.	Brown	Med.	MR
Selby	SD	2000	Late	Brown	Tall	MR
Shape	Can.	2010	Med.	Brown	Med.	R
Webster	SD	1998	Late	Brown	Tall	MR
York	ND	2002	Late	Brown	Med.	R

[1] All varieties have resistance to prevalent races of rust; all have good oil yield and oil quality.

[2] Can. = Canada; ND = North Dakota State University; SD = South Dakota State University.

[3] R = resistant; MR = moderately resistant; MS = moderately susceptible; NA = not available.

Table 3. Flax Planting and Harvest Dates, ND, 2011.

Location	Plant	Harvest
Carrington	May 5	Aug. 29
Langdon	May 19	Sept. 19
Hettinger	May 3	Aug. 24
Williston	May 19	Aug. 26

Table 4. Flax Seed Yield (bu/acre), North Dakota, 2009-2011.

	Carrington		Langdon		Hettinger		Williston		Average	
Variety	2011	3 Year	2011	3 Year	2011	3 Year	2011	3 Year	2011	3 Year
AC Lightning	22.3	25.6	39.6	42.7	23.3	25.0	12.0	14.3	24.3	26.9
Bison[1]	--	--	37.1	37.1	--	--	11.5	14.9	--	--
Carter[2]	24.4	27.5	41.1	41.7	24.1	25.3	13.2	15.2	25.7	27.4
CDC Arras	24.7	25.2	39.8	41.3	26.5	27.0	11.9	14.8	25.7	27.1
CDC Bethune	23.1	28.4	37.5	41.9	23.4	24.9	12.9	15.5	24.2	27.7
CDC Sorrel	20.2	26.5	40.8	39.7	24.3	24.8	13.7	15.5	24.7	26.6
Hanley	24.5	28.0	41.0	--	24.7	24.8	11.7	14.5	25.5	--
Linott[1]	--	--	44.1	41.9	--	--	12.3	14.6	--	--
McGregor[1]	--	--	44.4	44.5	--	--	12.8	14.6	--	--
Neche	21.4	27.2	37.0	42.9	--	--	12.8	14.8	--	--
Nekoma	20.8	23.7	38.4	42.5	25.1	25.1	13.2	15.0	24.4	26.6
Omega[2]	19.6	25.5	42.0	39.1	--	--	12.3	14.3	--	--
Pembina	22.2	26.3	45.2	44.6	23.4	24.3	14.0	14.6	26.2	27.5
Prairie Blue	27.4	27.8	44.0	45.2	26.4	25.1	13.0	15.4	27.7	28.4
Prairie Grande	26.3	29.1	37.5	39.7	27.5	26.4	12.4	14.4	25.9	27.4
Prairie Thunder	25.8	--	40.9	40.0	28.2	26.1	13.3	15.3	27.0	--
Rahab 94	22.9	28.2	39.6	42.9	--	--	12.4	14.4	--	--
Shape	24.9	28.4	--	--	24.2	--	--	--	--	--
Webster	24.0	26.0	43.3	44.6	27.1	24.2	13.5	15.3	27.0	27.5
York	23.0	24.7	43.7	44.4	28.8	27.7	12.6	14.9	27.0	27.9
Mean	23.5	26.8	41.0	42.0	25.7	25.5	12.7	14.9	25.9	27.4
CV %	10.6	--	9.9	--	10.2	--	10.8	--	--	--
LSD 0.05	3.5	--	5.9	--	3.7	--	NS	--	--	--

[1]Long-term check.

[2]Yellow seeded.

Table 5. Flax Days to Flower[1], North Dakota, 2011.

Variety	Carrington	Langdon	Hettinger	Williston	Average
AC Lightning	60	50	62	50	56
Bison[2]	--	50	--	49	--
Carter[3]	59	50	63	52	--
CDC Arras	59	50	64	50	56
CDC Bethune	58	50	63	51	56
CDC Sorrel	60	52	64	52	57
Hanley	58	50	61	51	55
Linott[1]	--	50	--	50	--
McGregor[1]	--	50	--	52	--
Neche	59	51	--	51	--
Nekoma	58	49	62	50	55
Omega[2]	59	51	--	51	
Pembina	59	50	62	50	55
Prairie Blue	57	51	63	52	56
Prairie Grande	59	48	62	47	54
Prairie Thunder	57	48	63	49	54
Rahab 94	59	50	--	50	--
Shape	59	--	63	--	--
Webster	58	52	63	51	56
York	58	50	63	51	56
Mean	59	50	63	50	55
CV %	1.4	1.5	1.0	1.6	--
LSD 0.05	1.2	1.1	1.0	1.1	--

[1] Days after planting.

[2]Long-term check.

[3]Yellow seeded.

Table 6. Flax Test Weight (lb/bu), North Dakota, 2011.

Variety	Carrington	Langdon	Hettinger	Williston	Average
AC Lightning	51.7	53.3	56.0	53.3	53.6
Bison[1]	--	53.3	--	53.3	--
Carter[2]	52.7	53.5	--	53.7	--
CDC Arras	52.4	53.0	54.7	53.2	53.3
CDC Bethune	51.2	52.8	55.3	53.1	53.1
CDC Sorrel	50.7	52.9	55.6	53.2	53.1
Hanley	51.2	53.1	55.8	53.4	53.4
Linott[1]	--	53.4	--	53.4	--
McGregor[1]	--	53.4	--	53.2	--
Neche	51.9	53.0	--	53.5	--
Nekoma	52.3	53.1	56.6	53.4	53.9
Omega[2]	52.0	53.5	--	53.5	--
Pembina	52.5	53.1	55.6	53.3	53.6
Prairie Blue	51.2	53.0	55.7	53.1	53.3
Prairie Grande	51.4	53.0	56.0	53.3	53.4
Prairie Thunder	51.9	53.3	56.1	53.5	53.7
Rahab 94	51.7	53.0	--	52.8	--
Shape	51.8	--	54.9	--	--
Webster	51.4	53.6	56.0	53.5	53.6
York	52.7	53.3	56.3	53.6	54.0
Mean	51.8	53.2	55.7	53.3	53.5
CV %	0.9	0.4	1.1	0.3	--
LSD 0.05	0.6	0.3	0.9	0.6	--

[1]Long-term check.

[2]Yellow seeded.

Table 7. Safflower Planting and Harvest Dates, North Dakota and Montana, 2011.

Location	Plant	Harvest
Hettinger	May 3	Sept. 9
Williston Fallow	May 6	Sept. 16
Williston Recrop	May 6	Sept. 16
Williston Irrigated	May 17	Oct. 5
Sidney Fallow	May 7	Sept. 30 and Oct. 8
Sidney Irrigated	May 10	Oct. 1

Table 8. Safflower Seed Yield (lb/acre), North Dakota and Montana, 2011.

	Hettinger	- - - - - - - Williston - - - - - - - -			- - - Sidney - - -		6 location
Variety	no-till	recrop	fallow	irrigated	fallow	irrigated	average
Oleic							
Hybrid 1601	1,791	1,855	2,122	1,826	2,165	2,869	2,105
Hybrid 9049	2,100	1,419	1,585	1,112	2,115	2,394	1,787
MonDak	2,078	1,434	1,718	941	2,236	2,628	1,839
Montola 2003	2,057	1,307	1,579	1,385	2,030	2,764	1,854
Linoleic							
Cardinal	1,607	1,493	1,883	1,506	2,187	2,354	1,838
Finch	1,785	1,348	1,471	1,129	1,736	2,070	1,590
NutraSaff	938	996	1,449	1,147	1,456	1,841	1,304
00B1597-3	1,951	1,271	--	1,399	1,697	1,934	--
00B1587-6	1,800	804	--	1,049	--	--	--
00B1589-7	1,658	626	--	1,506	--	--	--
Mean	1,777	1,193	1,542	1,300	1,806	2,139	--
CV %	8.0	13.4	8.4	16	6.9	5.4	--
LSD 0.05	207	264	183	300	352	333	--

Table 9. Safflower Plant Height (inches), North Dakota and Montana, 2011.

	Hettinger	- - - - - - - Williston - - - - - - - -			- - - Sidney - - -		6 loc
Variety	no-till	recrop	fallow	irrig	fallow	irrigated	average
Oleic							
Hybrid 1601	35	28	23	17	25	30	26.2
Hybrid 9049	33	25	22	18	25	28	25.1
MonDak	33	25	22	17	24	32	25.3
Montola 2003	30	22	20	16	22	29	23.0
Linoleic							
Cardinal	36	27	24	19	25	31	26.9
Finch	34	26	24	19	24	32	26.4
NutraSaff	34	27	24	19	25	30	26.5
00B1597-3	35	25	--	21	24	30	--
00B1587-6	35	28	--	20	--	--	--
00B1589-7	34	26	--	21	--	--	--
Mean	34	25	21	19	23	29	--
CV %	4.0	5.8	8.3	8.3	3.2	3.7	--
LSD 0.05	2	2	3	2.3	2	3	--

Table 10. Safflower Test Weight (lb/bu), North Dakota and Montana, 2011.

	Hettinger	- - - - - - - Williston - - - - - - - -			- - - Sidney - - -		6 location
Variety	no-till	recrop	fallow	irrigated	fallow	irrig	average
Oleic							
Hybrid 1601	34.1	42.6	42.3	34.7	41.7	40.5	39.3
MonDak	35.5	44.9	44.2	36.1	43.8	41.3	41.0
Montola 2003	35.3	43.2	43.3	37.8	43.3	41.8	40.8
Linoleic							
Cardinal	34.6	45.7	45.8	38.5	44.5	43.3	42.1
Finch	34.1	46.6	46.2	40.1	45.7	43.0	42.6
NutraSaff	45.0	39.5	38.7	34.7	40.0	39.3	39.5
00B1597-3	36.3	43.6	--	35.0	41.2	39.5	--
00B1587-6	37.7	42.0	--	35.2	--	--	--
00B1589-7	38.4	42.4	--	36.2	--	--	--
Mean	36.4	43.2	41.5	36.5	41.4	39.9	--
CV %	4.0	0.7	1.2	1.7	0.6	0.8	--
LSD 0.05	2.1	0.6	1.0	1.4	0.6	0.9	--

Table 11. Safflower Seed Oil (%), North Dakota and Montana, 2011.

	Hettinger	- - - - - - - Williston - - - - - - - -			- - - Sidney - - -		6 location
Variety	no-till	recrop	fallow	irrigated	fallow	irrigated	average
Oleic							
Hybrid 1601	43.0	35.0	34.5	34.0	38.9	36.6	37.0
Hybrid 9049	39.2	29.3	29.1	29.3	33.6	30.9	31.9
MonDak	36.9	34.0	34.2	30.6	37.0	36.3	34.8
Montola 2003	39.0	35.4	36.5	34.1	39.5	38.8	37.2
Linoleic							
Cardinal	41.4	34.1	34.9	32.5	37.9	37.3	36.3
Finch	39.4	34.8	35.7	34.9	38.8	38.2	37.0
NutraSaff	43.7	44.9	45.8	44.2	50.0	49.1	46.3
00B1597-3	34.6	36.8	--	37.1	41.2	40.7	--
00B1587-6	35.9	37.0	--	36.8	--	--	--
00B1589-7	35.7	39.7	--	39.1	--	--	--
Mean	38.9	36.5	38.0	35.2	42.3	40.7	--
CV %	4.4	0.9	0.8	2.3	0.9	1.3	--
LSD 0.05	2.5	0.7	0.6	1.9	1.1	1.5	--

Table 12. Lentil Planting and Harvest Dates, and Previous Crop, North Dakota, 2011.

Location	Plant	Harvest	Previous Crop
Dickinson	May 6	Aug. 10	Oat
Hettinger	May 3	Aug. 11	HRSW
Williston	April 29	Aug. 7	Durum

Seeding rate was 14 pure live seeds/foot^2.

Table 13. Lentil Average Yield Across Locations (lb/acre), North Dakota, 2011.

Variety	Seed Coat Color	Market Type	Average Yield Across Locations % of CDC Richlea	
			2011	2 Year[1]
CDC Greenland	Green	Large	84	91
CDC LeMay	French Green	Small	86	93
CDC Red Rider	Red	Medium	115	112
CDC Redberry	Red	Small	100	106
CDC Richlea	Green	Medium	100	100
CDC Rosetown	Red	Ext. Small	105	103
CDC Rouleau	Red	Small	92	99
CDC Viceroy	Green	Small	104	104
Pennell	Green	Large	93	89
Riveland	Green	Large	77	76

[1] Based on 2010 and 2011 percentage.

Table 14. Lentil Seed Yield (lb/acre), North Dakota, 2011.

Variety	Dickinson	Hettinger	Williston	Average
French Green				
CDC LeMay	2,082	1,140	1,539	1,587
Green				
CDC Greenland	2,005	1,254	1,400	1,553
CDC Richlea	2,291	1,463	1,797	1,850
CDC Viceroy	2,362	1,710	1,695	1,922
Pennell	2,238	1,551	1,394	1,728
Riveland	2,041	1,010	1,245	1,432
Red				
CDC Redberry	2,218	1,870	1,468	1,852
CDC Red Rider	2,499	1,984	1,921	2,135
CDC Rosetown	2,374	1,711	1,719	1,935
CDC Rouleau	2,133	1,656	1,332	1,707
Mean	2,224	1,535	1,551	1,770
CV %	4.1	6.0	11.2	7.1
LSD 0.05	134	134	252	346

Table 15. Lentil Days to 10% Flowering, North Dakota, 2011.

Variety	Dickinson	Hettinger	Williston	Average
French Green				
CDC LeMay	55	60	57	57
Green				
CDC Greenland	55	62	57	58
CDC Richlea	54	62	56	57
CDC Viceroy	56	63	58	59
Pennell	55	61	59	58
Riveland	54	61	54	56
Red				
CDC Redberry	55	60	57	57
CDC Red Rider	55	61	55	57
CDC Rosetown	56	63	58	59
CDC Rouleau	55	61	58	58
Mean	55	61	57	58
CV %	1.2	1.4	1.9	1.5
LSD 0.05	1	1	2	2

Table 16. Lentil 1,000 Seed Weight (grams), North Dakota, 2011.

Variety	Dickinson	Hettinger	Williston	Average
French Green				
CDC LeMay	33	31	33	32
Green				
CDC Greenland	63	58	65	62
CDC Richlea	52	52	53	52
CDC Viceroy	35	31	32	33
Pennell	70	64	65	66
Riveland	76	66	70	71
Red				
CDC Redberry	45	44	42	44
CDC Red Rider	46	44	44	45
CDC Rosetown	30	27	30	29
CDC Rouleau	44	41	43	43
Mean	49	46	48	48
CV %	4.3	6.8	2.4	5.1
LSD 0.05	3	5	3	4

Table 17. Lentil Canopy Height (cm), North Dakota, 2011.

Variety	Dickinson	Hettinger	Williston	Average
French Green				
CDC LeMay	31	24	26	27
Green				
CDC Greenland	34	28	26	29
CDC Richlea	29	27	27	28
CDC Viceroy	33	27	28	29
Pennell	31	29	27	29
Riveland	33	25	32	30
Red				
CDC Redberry	31	30	29	30
CDC Red Rider	34	28	30	31
CDC Rosetown	21	27	27	25
CDC Rouleau	31	27	30	29
Mean	32	27	28	29
CV %	6.8	10.1	8.0	8.3
LSD 0.05	3	4	3	3.8

Table 18. Lentil Test Weight (lb/bu), North Dakota, 2011.

Variety	Dickinson	Hettinger	Williston	Average
French Green				
CDC LeMay	63.3	67.4	63.0	64.6
Green				
CDC Greenland	60.0	62.6	57.6	60.1
CDC Richlea	60.3	64.1	60.3	61.6
CDC Viceroy	63.5	66.9	63.1	64.5
Pennell	58.3	60.9	57.4	58.9
Riveland	58.3	61.3	56.7	58.8
Red				
CDC Redberry	61.9	66.5	62.7	63.7
CDC Red Rider	62.1	65.9	62.4	63.5
CDC Rosetown	63.8	68.0	63.1	65.0
CDC Rouleau	61.5	66.7	62.6	63.6
Mean	61.3	65.0	60.9	62.4
CV %	2.3	1.1	0.5	1.6
LSD 0.05	2.1	1.1	0.6	1.5

Table 19. Lentil Seeds/lb, North Dakota, 2011.

Variety	Dickinson	Hettinger	Williston	Average
French Green				
CDC LeMay	13,764	14,849	13,635	14,083
Green				
CDC Greenland	7,272	7,857	7,028	7,386
CDC Richlea	8,817	8,813	8,587	8,739
CDC Viceroy	13,083	14,666	14,063	13,937
Pennell	6,466	7,061	6,944	6,824
Riveland	6,001	6,856	6,451	6,436
Red				
CDC Redberry	10,102	10,615	10,785	10,501
CDC Red Rider	9,840	10,370	10,413	10,208
CDC Rosetown	15,190	16,740	15,140	15,690
CDC Rouleau	10,337	10,988	10,610	10,645
Mean	10,087	10,881	10,365	10,444
CV%	5.2	6.5	2.5	5.4
LSD 0.05	754	1,019	592	848

Table 20. Clearfield Lentil Planting and Harvest Dates, and Previous Crop, ND, 2011.

Location	Plant	Harvest	Previous Crop
Carrington	May 9	August 26	HRSW
Hettinger	May 4	August 11	HRSW
Minot	May 7	August 30	Fallow
Williston	May 5	August 17	Durum
New Town	May 19	August 26	Durum

Table 21. Clearfield Lentil Seed Yield (lb/acre), North Dakota, 2011.

Variety	Carrington	Hettinger	Minot	Williston	New Town	Average
Green						
CDC Impress-CL	575	1,760	964	1,391	1,138	1,166
CDC Improve-CL	453	1,722	875	1,161	1,029	1,048
Red						
CDC Impact-CL	681	1,841	1,000	1,158	909	1,118
CDC-Impala-CL	674	1,712	1,125	1,367	905	1,157
CDC-Imperial-CL	840	1,620	1,047	1,399	1,303	1,242
CDC-Maxim-CL	1,205	1,874	1,358	1,421	1,266	1,425
Mean	738	1,755	1,061	1,316	1,092	1,192
CV %	17.3	4.6	15.7	7.4	14.0	--
LSD 0.05	193	122	251	147	278	--

Table 22. Clearfield Lentil Test Weight (lb/bu), North Dakota, 2011.

Variety	Carrington	Hettinger	Minot	Williston	New Town	Average
Green						
CDC Impress-CL	50.1	58.8	56.5	60.3	60.8	57.3
CDC Improve-CL	50.6	59.9	55.1	58.7	60.2	56.9
Red						
CDC Impact-CL	55.6	66.5	59.6	63.8	61.7	61.4
CDC-Impala-CL	57.9	65.9	61.5	63.6	63.2	62.4
CDC-Imperial-CL	55.1	63.2	59.0	63.2	63.0	60.7
CDC-Maxim-CL	54.5	64.3	60.5	62.6	62.4	60.9
Mean	54.0	63.1	58.7	62.0	61.9	59.9
CV%	1.6	1.3	1.2	0.7	0.6	--
LSD 0.05	1.3	1.2	1.0	1.0	0.9	--

Table 23. Clearfield Lentil Canopy Height (cm), ND, 2011.

Variety	Hettinger	Minot	Williston	Average
Green				
CDC Impress-CL	29	26	30	28
CDC Improve-CL	36	30	32	33
Red				
CDC Impact-CL	30	27	25	27
CDC-Impala-CL	34	28	29	30
CDC-Imperial-CL	31	27	28	29
CDC-Maxim-CL	32	31	30	31
Mean	32	28	29	30
CV%	3.4	9.4	7.1	--
LSD 0.05	2	4	3	--

Table 24. Clearfield Lentil 1000 Seed Weight (grams), North Dakota, 2011.

Variety	Carrington	Hettinger	Minot	Williston	New Town	Average
Green						
CDC Impress-CL	32	39	38	51	47	41
CDC Improve-CL	43	64	49	71	71	60
Red						
CDC Impact-CL	24	32	29	36	33	31
CDC-Impala-CL	23	27	23	30	30	27
CDC-Imperial-CL	21	24	21	29	27	24
CDC-Maxim-CL	28	34	31	40	35	34
Mean	28	37	32	43	40	36
CV%	5.6	10.1	6.1	1.8	3.5	--
LSD 0.05	2	6	3	2	4	--

Table 25. Clearfield Lentil Seeds/lb, North Dakota, 2011.

Variety	Carrington	Hettinger	Minot	Williston	New Town	Average
Green						
CDC Impress-CL	14,345	11,839	12,098	8,919	9,657	11,372
CDC Improve-CL	10,552	7,084	9,351	6,431	6,436	7,971
Red						
CDC Impact-CL	19,258	14,065	15,903	12,474	13,958	15,132
CDC-Impala-CL	20,023	16,850	19,724	14,942	15,195	17,347
CDC-Imperial-CL	21,900	18,978	21,589	15,443	17,139	19,010
CDC-Maxim-CL	16,481	13,288	14,902	11,273	12,817	13,752
Mean	17,093	13,684	15,594	11,580	12,533	14,097
CV %	5.4	10.2	7.6	2.5	4.0	--
LSD 0.05	1,377	2,105	1,787	743	1,292	--

Table 26. Clearfield Lentil Days to 10% Flowering, ND, 2011.

Variety	Hettinger	Minot	Williston	Average
Green				
CDC Impress-CL	58	57	53	56
CDC Improve-CL	58	57	52	56
Red				
CDC Impact-CL	59	55	52	55
CDC-Impala-CL	61	59	53	58
CDC-Imperial-CL	59	55	54	56
CDC-Maxim-CL	58	56	54	56
Mean	59	56	53	56
CV%	0.6	2.1	1.7	--
LSD 0.05	1	2	1	--

Table 27. Chickpea Variety x Fungicide Trial Planting and Harvest Dates, and Previous Crop, North Dakota, 2011.

Location[1]	Plant	Harvest	Previous Crop
Hettinger	May 3	Aug. 6	HRSW
Williston	May 26	Sept. 22	Soybean

[1] Carrington and Minot trials were lost due to high disease pressure and excess water, respectively. Multiple applications of foliar fungicides were applied to manage ascochyta blight in fungicide plots. Seeding rate was 4 pure live seeds/foot^2.

Table 28. Chickpea Variety x Fungicide Trial Seed Yield (lb/acre), North Dakota, 2011.

	Hettinger		Williston		Average	
Variety	Fungicide	No Fung.	Fungicide	No Fung.	Fungicide	No Fung.
Kabuli						
B-90	1,029	970	1,301	1,209	1,165	1,090
CDC Frontier	1,106	1,219	1,358	1,429	1,232	1,324
CDC Luna	1,114	331	1,112	665	1,113	498
Dylan	145	0	1,215	111	680	56
Sawyer	1,090	135	1,235	1,004	1,163	570
Sierra	457	0	1,053	377	755	189
Troy	191	0	1,147	154	669	77
Desi						
CDC Anna	1,692	617	1,478	1,135	1,585	876
Mean	853	409	1,237	761	1,045	585
CV %	34.8		8.5		--	--
LSD 0.05	368		142		--	--

Table 29. Chickpea Variety x Fungicide Trial Days to 10% Flowering, North Dakota, 2011.

	Hettinger		Williston		Average	
Variety	Fungicide	No Fung.	Fungicide	No Fung.	Fungicide	No Fung.
Kabuli						
B-90	62	61	43	43	49	52
CDC Frontier	61	60	41	42	48	51
CDC Luna	59	59	43	43	48	51
Dylan	59	59	40	41	46	50
Sawyer	62	61	41	41	48	51
Sierra	63	63	42	43	49	53
Troy	63	63	44	44	50	54
Desi						
CDC Anna	62	60	40	41	47	51
Mean	62	61	42	42	48	52
CV%	2.2		2.0		--	--
LSD 0.05	2		1		--	--

Table 30. Chickpea Variety x Fungicide Trial Ascochyta Blight Rating[1], North Dakota, 2011.

	Hettinger				Williston	
Variety	Early		Late			
	Fungicide	No Fung.	Fungicide	No Fung.	Fungicide	No Fung.
Kabuli						
B-90	1.0	2.0	1.3	2.7	1.0	2.3
CDC Frontier	1.0	1.7	1.0	2.0	1.0	2.7
CDC Luna	1.0	2.3	1.0	2.7	1.7	3.7
Dylan	2.0	5.3	2.0	7.0	2.3	6.7
Sawyer	1.3	2.3	1.7	4.7	2.7	3.3
Sierra	1.3	3.0	2.7	5.7	2.3	5.0
Troy	1.0	6.0	2.3	7.0	2.3	5.3
Desi						
CDC Anna	1.0	2.0	1.3	2.7	1.0	3.0
Mean	1.2	3.1	1.7	4.3	1.8	4.0
CV%	45.4		15.8		17.9	
LSD 0.05	1.6		0.8		0.9	

[1] *Ascochyta blight rating based on scale 1-9 (1 = no infection, 9 = 100% infection).*

Table 31. Chickpea Variety x Fungicide Trial Test Weight (lb/bu), North Dakota, 2011.

	Hettinger		Williston		Average	
Variety	Fungicide	No Fung.	Fungicide	No Fung.	Fungicide	No Fung.
Kabuli						
B-90	55.0	55.7	54.4	54.3	54.7	55.0
CDC Frontier	58.0	55.3	54.0	54.0	56.0	54.7
CDC Luna	53.0	40.5	53.6	55.1	53.3	47.8
Dylan	38.3	0	53.8	53.2	46.1	26.6
Sawyer	53.3	0	57.1	57.3	55.2	28.7
Sierra	38.1	0	55.9	53.4	47.0	26.7
Troy	38.2	0	53.9	53.4	46.1	26.7
Desi						
CDC Anna	53.0	53.0	46.8	47.1	49.9	50.1
Mean	48.4	25.6	53.7	53.5	51.0	39.5
CV%	4.8		1.9		--	--
LSD 0.05	3.1		1.8		--	--

Table 32. Chickpea Variety x Fungicide Trial 1,000 Seed Weight (grams), North Dakota, 2011.

	Hettinger		Williston		Average	
Variety	Fungicide	No Fung.	Fungicide	No Fung.	Fungicide	No Fung.
Kabuli						
B-90	276	210	268	250	272	230
CDC Frontier	305	272	358	341	332	307
CDC Luna	340	185	373	291	357	238
Dylan	143	0	525	196	334	98
Sawyer	392	119	406	371	399	245
Sierra	306	0	460	265	383	133
Troy	184	0	573	273	379	137
Desi						
CDC Anna	195	144	183	175	189	160
Mean	268	116	393	270	330	193
CV %	26.4		6.7		--	--
LSD 0.05	85		37		--	--

Table 33. Chickpea Variety x Fungicide Trial Seeds/lb, North Dakota, 2011.

	Hettinger		Williston		Average	
Variety	Fungicide	No Fung.	Fungicide	No Fung.	Fungicide	No Fung.
Kabuli						
B-90	1,648	2,192	1,698	1,822	1,673	2,007
CDC Frontier	1,512	1,671	1,269	1,334	1,391	1,503
CDC Luna	1,353	2,558	1,217	1,566	1,285	2,062
Dylan	3,122	0	864	2,335	1,993	1,168
Sawyer	1,161	1,706	1,119	1,229	1,140	1,468
Sierra	1,636	0	986	1,740	1,311	870
Troy	2,533	0	793	1,728	1,663	864
Desi						
CDC Anna	2,333	3,153	2,480	2,604	2,407	2,879
Mean	1,912	1,410	1,303	1,795	1,608	1,602
CV %	28.8		8.2		--	--
LSD 0.05	803		212		--	--

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