North Dakota Flax Performance Testing 2011

Compiled by Hans Kandel, Extension Agronomist
Greg Endres, Carrington Research Extension Center

James Hammond,
NDSU Plant Sciences Department
Eric Eriksmoen and Rick Olson,
Hettinger Research Extension Center
Bryan Hanson and Richard Wilhelmi,
Langdon Research Extension Center
Mark Halvorson,
North Central Research Extension Center, Minot
Gordon Bradbury and Sara Loomer,
Tyler Tjelde and Cameron Wahlstrom.
Williston Research Extension Center
Blaine Schatz,
Carrington Research Extension Center

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List of Tables

Flax

This report summarizes flax variety performance at the various North Dakota State University Research Extension Centers. The relative performance of the varieties is presented in table format. Give special attention to yield results of those trials nearest to your production area when evaluating varieties in these trials. Also, attempt to view yield averages of several years rather than using only one year's data as a determining factor. In addition, also consider other agronomic characteristics, such as maturity, lodging score and oil percentages, if available.

The agronomic data presented 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. 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. Only compare values within the table and look for trends for the desired trait among different experimental sites and years. Oil content and harvested seed yield were adjusted to 9 percent moisture.

Table 1. 2011 North Dakota 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 2. Plant Height of Flax Varieties at Four Locations in North Dakota, 2011.

Variety	Carrington Plant Height	Langdon Plant Height	Hettinger Plant Height	Williston Plant Height	Average N.D. Plant Height
	(inch)	(inch)	(inch)	(inch)	(inch)
AC Lightning	22	27	21	17	22
Bison[1]	--	28	--	18	--
Carter[2]	24	28	20	16	--
CDC Arras	22	28	21	18	22
CDC Bethune	25	28	22	18	23
CDC Sorrel	25	30	23	18	24
Hanley	24	29	21	17	23
Linott[1]	--	29	--	19	--
McGregor[1]	--	28	--	19	--
Neche	23	29	--	18	--
Nekoma	24	28	21	18	23
Omega[2]	24	28	--	17	--
Pembina	25	29	21	18	23
Prairie Blue	21	27	22	18	22
Prairie Grande	24	24	22	15	21
Prairie Thunder	23	25	22	16	22
Rahab 94	24	25	--	17	--
Shape	23	--	24	--	--
Webster	22	30	23	18	23
York	21	28	21	18	22
Mean	23	28	22	50	23
CV %	4.2	4.8	8.0	1.6	--
LSD 0.05	1.4	1.9	NS	1.1	--

[1]Long-term check.
[2]Yellow seeded.

Table 3. Days to Flower of Flax Varieties at Four Locations in North Dakota, 2011.

Variety	Carrington Days to Flower	Langdon Days to Flower	Hettinger Days to Flower	Williston Days to Flower	Average N.D. Days to Flower
	(DAP)[3]	(DAP)	(DAP)	(DAP)	(DAP)
AC Lightning	60	50	62	50	56
Bison[1]	--	50	--	49	--
Carter[2]	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]Long-term check.
[2]Yellow seeded.
[3]DAP = Days after planting.

Table 4. Yield of Flax Varieties at Four Locations in North Dakota, 2009-2011.

	Carrington Yield		Langdon Yield		Hettinger Yield		Williston Yield		Avg. North Yield	
Variety	**2011**	**3 Yr.**	**2011**	**3 Yr.**	**2011**	**3 Yr.**	**2011**	**3 Yr.**	**2011**	**3 Yr.**
	----(bu/a)----		----(bu/a)----		----(bu/a)----		---(bu/a)---		----(bu/a)---	
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. Test Weight of Flax Varieties at Four Locations in North Dakota, 2011.

Variety	Carrington Test Wt.	Langdon Test Wt.	Hettinger Test Wt.	Williston Test Wt.	Average N.D. Test Wt.
	(lb/bu)	(lb/bu)	(lb/bu)	(lb/bu)	(lb/bu)
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 6. 2011 Flax - Carrington - Author, B. Schatz.

Variety	Days to Flower	Days to PM	Plant Lodge A[1]	Plant Lodge B[2]	Plant Height	Oil Content	Test Weight	Seed Yield		
								2011	2-yr Avg.	3-yr Avg.
	(DAP)[3]	(DAP)[3]	(0-9)	(0-9)	(inch)	(%)	(lb/bu)	----------(bu/a)----------		
AC Lightning	60	91	4	4	22	38.9	51.7	22.3	22.7	25.6
Carter[4]	59	93	2	2	24	39.4	52.7	24.4	25.3	27.5
CDC Arras	59	90	3	3	22	39.5	52.4	24.7	22.6	25.2
CDC Bethume	58	91	5	6	25	39.3	51.2	23.1	23.4	28.4
CDC Sorrel	60	90	7	8	25	38.9	50.7	20.2	23.2	26.5
Hanley	58	91	3	5	24	42.4	51.2	24.5	25.0	28.0
Neche	59	91	5	5	23	38.8	51.9	21.4	24.1	27.2
Nekoma	58	91	3	3	24	39.8	52.3	20.8	20.8	23.7
Omega[4]	59	93	2	2	24	40.3	52.0	19.6	24.0	25.5
Pembina	59	92	3	3	25	40.0	52.5	22.2	23.1	26.3
Prairie Blue	57	90	1	4	21	39.8	51.2	27.4	24.2	27.8
Prairie Grande	59	93	2	3	24	40.0	51.4	26.3	25.3	29.1
Prairie Thunder	57	92	1	3	23	39.5	51.9	25.8	26.9	--
Rahab 94	59	93	3	4	24	38.6	51.7	22.9	25.5	28.2
Shape	59	90	3	5	23	38.6	51.8	24.9	23.5	28.4
Webster	58	91	4	4	22	38.7	51.4	24.0	23.5	26.0
York	58	95	1	1	21	38.8	52.7	23.0	22.6	24.7
Mean	58	91	3	4	23	39.5	51.8	23.4	23.8	26.7
CV %	1.4	1.3	59	44	4.2	1.5	0.9	10.6	--	--
LSD 0.05	1	2	2	2	1.4	0.9	0.6	3.5	--	--

Planted: May 5. Harvested: Aug. 29. Previous crop: spring wheat.

[1] Plant Lodge A: Plant lodging recorded when cultivars reached physiological maturity. 0 = none, 9 = lying flat on the ground.

[2] Plant Lodge B: Plant lodging recorded just prior to trial being direct combined. 0 = none, 9 = lying flat on the ground.

[3]DAP = Days after planting.

[4]Yellow seeded.

Table 7. 2011 Flax - Hettinger - Authors, E. Ericksmoen and R. Olson.

Variety	Days to Flower	Plant Height	Test Weight	Seed Yield				
				2008	2009	2011	2-yr Avg.	3-yr Avg.
	(DAP)[1]	(inch)	(lb/bu)	----------(bu/a)----------				
AC Lightning	62	21	56.0	12.3	39.3	23.3	31.3	25.0
Carter[2]	63	20	--	11.3	40.6	24.1	32.4	25.3
CDC Arras	64	21	54.7	12.4	42.0	26.5	34.2	27.0
CDC Bethume	63	22	55.3	10.1	41.1	23.4	32.2	24.9
CDC Sorrel	64	23	55.6	10.4	39.8	24.3	32.0	24.8
Hanley	61	21	55.8	9.6	40.2	24.7	32.4	24.8
Nekoma	62	21	56.6	11.2	39.1	25.1	32.1	25.1
Pembina	62	21	55.6	11.6	37.9	23.4	30.6	24.3
Prairie Blue	63	22	55.7	9.5	39.4	26.4	32.9	25.1
Prairie Grande	62	22	56.0	11.6	40.1	27.5	33.8	26.4
Prairie Thunder	63	22	56.1	8.2	42.0	28.2	35.1	26.1
Shape	63	24	54.9	--	--	24.2	--	--
Webster	63	23	56.0	11.1	34.5	27.1	30.8	24.2
York	63	21	56.3	13.4	40.8	28.8	34.8	27.7
Mean	63	22	55.7	11.0	39.8	25.5	32.7	25.4
CV %	1.0	8.0	1.1	11.8	6.9	10.2	--	--
LSD 0.05	1	NS	0.9	1.8	3.8	3.7	--	--

Planted: May 3. Harvested: Aug. 24.

[1]DAP = Days after planting.

[2]Yellow seeded.

Table 8. 2011 Flax - Langdon - Authors B. Hanson and R. Wilhelmi.

Variety	Days to Flower	Plant Height	Test Weight	Seed Yield				
				2009	2010	2011	2-yr Avg.	3-yr Avg.
	(DAP)[1]	(inch)	(lb/bu)	----------(bu/a)----------				
AC Lightning	50	27	53.3	40.0	48.5	39.6	44.1	42.7
Bison	50	28	53.3	29.2	45.1	37.1	41.1	37.1
Carter[2]	50	28	53.5	37.0	47.1	41.1	44.1	41.7
CDC Arras	50	28	53.0	35.9	48.1	39.8	44.0	41.3
CDC Bethune	50	28	52.8	37.1	51.1	37.5	44.3	41.9
CDC Sorrel	52	30	52.9	33.6	44.8	40.8	42.8	39.7
Hanley	50	29	53.1	--	51.2	41.0	46.1	--
Linott	50	29	53.4	35.4	46.2	44.1	45.1	41.9
McGregor	50	28	53.4	38.1	51.0	44.4	47.7	44.5
Neche	51	29	53.0	41.8	49.8	37.0	43.4	42.9
Nekoma	49	28	53.1	39.7	49.4	38.4	43.9	42.5
Omega[2]	51	28	53.5	30.7	44.5	42.0	43.2	39.1
Pembina	50	29	53.1	40.0	48.6	45.2	46.9	44.6
Prairie Blue	51	27	53.0	41.1	50.5	44.0	47.3	45.2
Prairie Grande	48	24	53.0	30.0	51.5	37.5	44.5	39.7
Prairie Thunder	48	25	53.3	28.4	50.7	40.9	45.8	40.0
Rahab 94	50	25	53.0	39.5	49.7	39.6	44.7	42.9
Webster	52	30	53.6	36.8	53.6	43.3	48.5	44.6
York	50	28	53.3	41.8	47.6	43.7	45.6	44.4
Mean	50	28	53.2	36.5	48.9	40.9	44.9	42.0
CV %	1.5	4.8	0.4	13.7	4.7	9.9	--	--
LSD 0.05	1	1.9	0.3	7.0	3.3	5.9	--	--

Planted: May 19. Harvested: Sept. 19. No lodging in the trial.

[1]DAP = Days after planting.

[2]Yellow seeded.

Table 9. 2011 Flax - McLean County (NCREC - Minot) - Author, M. Halvorson.

Variety	1,000 Seed Weight	Test Weight	Oil Content	Seed Yield		
				2010	2011	2-yr. Avg.
	(gram)	(lb/bu)	(%)	----------(bu/a)----------		
Carter[1]	5.2	48.4	42.7	21.8	18.8	20.3
Nekoma	5.1	47.1	42.1	21.8	18.0	19.9
Omega[1]	5.6	47.2	43.2	20.5	21.7	21.1
Prairie Thunder	5.3	47.6	42.6	14.0	19.0	16.5
Rahab 94	5.6	45.1	41.9	16.0	17.4	16.7
York	5.4	47.3	41.3	19.1	18.3	18.7
Mean	5.4	47.1	42.3	18.9	18.8	18.9
CV %	3.0	5.3	1.1	15.2	23.3	--
LSD 0.05	0.2	NS	0.7	4.3	NS	--

Planted: May 25. Seeding rate of 4 million PLS/acre.

Harvested: Sept 9.

[1]Yellow seeded.

Table 10. 2011 Flax - Sheridan County (NCREC - Minot) - Author, M. Halvorson.

Variety	Days to Maturity (DAP)1	Plant Height (inch)	Test Weight (lb/bu)	Oil Content (%)	Seed Yield 2011 (bu/a)
Carter[2]	83	22	53.7	41.4	26.1
Nekoma	82	21	53.3	40.9	21.6
Omega[2]	83	22	52.5	40.6	18.6
Prairie Thunder	80	22	52.7	40.1	21.4
Rahab 94	80	24	53.1	40.9	25.5
York	83	22	53.0	38.8	27.2
Mean	82	22	53.0	40.5	23.4
CV %	1.4	5.0	1.0	1.1	13.7
LSD 0.05	1.7	NS	NS	0.7	4.8

Planted: May 26. Seeding rate of 4 million PLS. Harvested: Sept. 19.

[1]DAP = Days after planting.

[2]Yellow seeded.

Table 11. 2011 Flax on Fallow - Williston - Authors, G. Bradbury and S. Loomer.

Cultivar	Days to Flower (DAP)[1]	Plant Height (inch)	Test Weight (lb/bu)	Seed Oil (%)	Average Yield 2011	Average Yield 2-yr. Avg.	Average Yield 3-yr. Avg.
					----------(bu/a)----------		
AC Lightning	50	17	53.3	38.6	12.0	13.1	14.3
Bison	49	18	53.3	38.0	11.5	13.5	14.9
Carter[2]	52	16	53.7	38.2	13.2	14.2	15.2
CDC Arras	50	18	53.2	37.9	11.9	14.2	14.8
CDC Bethune	51	18	53.1	38.5	12.9	14.2	15.5
CDC Sorrel	52	18	53.2	38.6	13.7	14.8	15.5
Hanley	51	17	53.4	37.6	11.7	13.3	14.5
Linott	50	19	53.4	37.7	12.3	13.7	14.6
McGregor	52	19	53.2	37.7	12.8	13.4	14.6
Neche	51	18	53.5	38.2	12.8	14.0	14.8
Nekoma	50	18	53.4	38.6	13.2	14.1	15.0
Omega[2]	51	17	53.5	38.1	12.3	13.3	14.3
Pembina	50	18	53.3	38.8	14.0	14.6	14.6
Prairie Blue	52	18	53.1	38.5	13.0	14.0	15.4
Prairie Grande	47	15	53.3	38.5	12.4	12.9	14.4
Prairie Thunder	49	16	53.5	37.7	13.3	14.2	15.3
Rahab 94	50	17	52.8	38.6	12.4	13.5	14.4
Webster	51	18	53.5	38.4	13.5	14.5	15.3
York	51	18	53.6	37.4	12.6	14.6	14.9
Mean	50	17	53.3	38.2	12.7	13.9	14.9
CV %	1.6	5.8	0.3	0.4	10.8	--	--
LSD 0.05	1.1	1.4	0.6	0.3	NS	--	--

Planted: May 19 into tilled soybean covercrop stubble from 2010. Harvested: Aug. 26.

[1]DAP = Days after planting.

[2]Yellow seeded.

Table 12. 2011 Flax - Irrigated - Williston - Authors, T. Tjelde and C. Wahlstrom.

Cultivar	Days to Flower	End Flower	Plant Height	Test Weight	Seed Oil	Seed Yield				
						2009	2010	2011	2-yr. Avg.	3-yr. Avg.
	(DAP)[1]	(DAP)[1]	(inch)	(lb/bu)	(%)	---------- (bu/a) ----------				
Carter[2]	51	63	22	51.8	40.6	50.1	30.3	17.8	24.0	32.7
Neche	51	55	22	52.6	41.2	37.7	28.7	10.0	19.3	25.5
Nekoma	51	55	23	52.7	40.7	42.4	31.3	17.6	24.5	30.4
Omega[2]	49	63	22	52.0	40.8	43.7	26.2	17.9	22.0	29.3
Prairie Thunder	49	62	22	52.1	40.5	-	31.2	22.0	26.6	26.6
York	51	64	21	53.0	40.0	46.7	34.2	23.8	29.0	34.9
Mean	50	60	22	52.5	40.6	42.6	30.3	18.2	24.3	29.3
CV %	--	1.3	4.6	0.7	0.7	11.9	9.4	13.1	--	--
LSD 0.05	NS	1.2	1.5	0.9	0.7	7.7	4.3	3.6	--	--

Planted: May 17. Harvested: Sept. 7. Previous crop: sugarbeet.

[1]DAP = Days after planting.

[2]Yellow seeded.

Table 13. 2011 Flax - Notill - Williston - Authors, G. Bradbury and S. Loomer.

Cultivar	Days to Flower	Plant Height	Test Weight	Seed Oil	Seed Yield				
					2009	2010	2011	2-yr. Avg.	3-yr. Avg.
	(DAP)[1]	(inch)	(lb/bu)	(%)	---------- (bu/a) ----------				
Carter[2]	52	20	53.9	37.6	18.7	16.6	13.5	15.0	16.3
Neche	52	20	53.7	36.6	22.3	11.8	14.7	13.3	16.3
Nekoma	51	21	53.6	38.0	20.8	14.8	14.1	14.4	16.6
Omega[2]	51	19	53.5	37.7	17.7	15.5	13.7	14.6	15.6
Pembina	51	22	53.7	38.3	19.0	14.0	11.5	12.8	14.8
York	50	19	53.2	37.6	--	14.2	17.0	15.6	--
Mean	51	20	53.5	37.6	20.0	14.1	14.2	14.1	15.8
CV %	0.7	4.8	0.2	1.1	11.7	19.7	11.9	--	--
LSD 0.05	0.6	1.5	0.2	NS	NS	NS	2.5	--	--

Planted: May 14 notill into pea stubble from 2010. Harvested: Aug. 26.

[1]DAP = Days after planting.

[2]Yellow seeded.