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North Dakota Flax

Variety Trial Results for 2023 and Selection Guide

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This selection guide summarizes flax variety performance at the various North Dakota State University Research Extension Centers. Give special attention to flax yield results of those trials nearest to your production area when evaluating varieties. Also, attempt to view yield averages of several years rather than using only one year's data as a determining factor. In addition, consider other agronomic characteristics, such as maturity, disease tolerance, 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% or 90% probability (LSD 0.05 or 0.10), 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 CV (coefficient of variation) is a measure of variability in the trial 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% moisture. The oil content data are not intended to be compared between locations.

In the table headings (Tables 4 to 7), the lead scientists are acknowledged. Presentation of data for the varieties tested does not imply approval or endorsement by the authors or agencies conducting the tests. NDSU approves the reproduction of any table in this publication only if no portion is deleted, appropriate footnotes are given, the order of the data is not rearranged and NDSU is credited for the data. Research specialists and technicians helped with the fieldwork and data compilation.

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Table 1. Flax Variety Descriptions Tested in 2023 in North Dakota.

Variety ¹	Origin ²	Year Released	Days to Flower Avg. ³	Seed Color	Plant Height		Fusarium Wilt ⁴
					inch	Avg. ³	
AAC Bright	Can.	2017	50	Yellow	26	26	MS/S ⁵
AAC Marvelous	Can.	2019	50	Brown	25	25	MR
Carter	ND	2004	47	Yellow	26	26	MS/S ⁵
CDC Dorado	Can.	2017	45	Yellow	25	25	MS ⁵
CDC Glas	Can.	2012	49	Brown	26	26	MS ⁵
CDC Kernen	Can.	2020	49	Brown	27	27	MR
CDC Neela	Can.	2013	49	Brown	21	21	MR
CDC Rowland	Can.	2018	50	Brown	25	25	MR
Gold ND	ND	2014	50	Yellow	27	27	MR/R
ND Hammond	ND	2018	48	Brown	26	26	MS
Omega	ND	1989	47	Yellow	25	25	MS ⁵
Webster	SD	1998	49	Brown	26	26	MR
York	ND	2002	48	Brown	26	26	MR/R

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

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

³Based on Carrington, Dickinson, Langdon, and Hettinger, 2023.

⁴R = resistant; MR = moderately resistant; MS = moderately susceptible; S = susceptible.

⁵This variety had fusarium wilt within the 2020 CREC flax variety trial, and rating has been adjusted accordingly.

Table 2. Yield of Flax Varieties at Four Locations in North Dakota, 2021-2023.

Variety	<u>Carrington</u>		<u>Dickinson</u>		<u>Hettinger</u>		<u>Langdon</u>		<u>Average N.D.</u>	
	2023	3 Yr. Avg. ¹	2023	3 Yr. Avg.	2023	3 Yr. Avg. ²	2023	3 Yr. Avg.	2023	3-Yr. Avg.
	------(bu/a)-----									
AAC Bright ³	31.0	26.4	24.2	19.2	31.9	20.9	31.9	38.4	29.7	26.2
AAC Marvelous	31.1	--	28.4	--	29.9	--	30.1	38.5	29.9	--
Carter ³	30.1	22.9	27.6	19.3	27.9	20.2	34.5	37.4	30.0	25.0
CDC Dorado ³	--	--	25.8	17.6	30.9	21.0	30.2	34.3	28.8	--
CDC Glas	30.9	24.2	28.4	18.9	31.1	21.1	28.1	38.0	29.6	25.5
CDC Kernen	29.5	--	31.5	--	31.9	--	22.9	--	29.0	--
CDC Neela	30.2	26.1	29.0	21.3	35.8	23.1	34.7	38.5	32.4	27.2
CDC Rowland	26.1	26.0	28.5	--	34.3	--	35.2	41.4	31.0	--
Gold ND ³	27.9	23.7	29.1	20.5	30.0	20.4	31.6	35.9	29.7	25.1
ND Hammond	28.1	22.6	27.2	19.2	28.5	20.0	31.4	36.9	28.8	24.7
Omega ³	28.6	19.7	25.2	18.8	29.3	21.2	31.0	34.0	28.5	23.4
Webster	27.7	24.7	27.1	20.2	30.1	21.1	30.6	37.5	28.9	25.9
York	31.9	24.1	26.6	19.4	32.2	22.3	34.7	39.5	31.4	26.3
Mean	28.3	24.0	28.1	19.4	30.3	21.1	31.3	37.5	29.8	25.5
CV %	10.5	--	12.3	--	10.4	--	8.3	--	5.6	--
LSD 0.05	2.7	--	4.8	--	3.7	--	5.6	--	3.4	--
LSD 0.10	2.2	--	3.7	--	2.9	--	4.7	--	2.8	--

¹Three-year average is for 2020, 2022 and 2023. Data is not available for 2021.²Average of 2020, 2021 and 2023³Yellow seeded.**Table 3. Test Weight and Oil Content of Flax Varieties at Four Locations in North Dakota, 2023.**

Variety	<u>Carrington</u>		<u>Dickinson</u>		<u>Hettinger</u>		<u>Langdon</u>	<u>Average N.D.</u>	
	Test Wt.	Oil	Test Wt.	Oil	Test Wt.	Oil	Test Wt.	Test Wt.	Oil
	(lb/bu)	(%)	(lb/bu)	(%)	(lb/bu)	(%)	(lb/bu)	(lb/bu)	(%)
AAC Bright ²	50.2	47.6	52.1	45.0	48.1	48.0	47.0	49.3	46.9
AAC Marvelous	52.9	47.7	53.2	44.7	49.5	46.9	50.5	51.5	46.4
Carter ²	53.8	46.1	54.0	43.8	49.7	45.6	51.5	52.3	45.2
CDC Dorado ³	--	--	53.0	44.0	49.7	47.0	47.2	50.1	--
CDC Glas	52.4	47.0	52.3	43.0	49.0	46.1	48.4	50.5	45.4
CDC Kernen	52.8	46.8	53.4	43.6	49.2	44.8	46.0	50.4	45.1
CDC Neela	54.5	45.6	52.9	43.2	50.0	45.8	51.3	52.2	44.9
CDC Rowland	52.6	45.3	53.4	43.8	49.6	45.5	50.2	51.5	44.9
Gold ND ²	40.0	47.6	53.8	44.2	50.1	46.5	52.2	49.0	46.1
ND Hammond	50.9	45.6	53.1	42.8	49.3	44.4	49.2	50.6	44.3
Omega ²	53.1	45.8	54.1	43.9	50.6	45.6	51.8	52.4	45.1
Webster	52.9	46.6	53.4	44.5	49.7	45.4	50.4	51.6	45.5
York	52.2	44.7	53.3	42.8	49.7	44.7	51.2	51.6	44.1
Mean	52.7	46.2	53.4	44.1	49.6	45.8	50.7	51.0	45.3
CV %	2.7	2.6	0.4	2.2	0.8	2.0	2.1	4.1	1.2
LSD 0.05	2.0	1.7	0.3	1.3	0.5	1.1	1.7	3.0	0.9
LSD 0.10	1.7	1.4	0.2	1.0	0.4	0.8	1.5	2.3	0.8

²Yellow seeded.

Table 4. 2023 Flax - Carrington - Authors, M. Ostlie and K. Simons.

Variety	Days to Flower (DAP) ²	Days to Mature (DAP) ²	Plant Height (inch)	Oil Content (%)	Test Weight (lb/bu)	Seed Yield		
						2023	2-yr. Avg.	3-yr. Avg. ¹
						------(bu/a)-----		
AAC Bright ³	47	93	24	47.6	50.2	31.0	27.1	26.4
AAC Marvelous	47	95	25	47.7	52.9	31.1	28.7	--
Carter ³	45	95	23	46.1	53.8	30.1	24.4	22.9
CDC Buryu	42	92	24	45.3	52.3	24.4	22.1	20.7
CDC Glas	47	91	24	47.0	52.4	30.9	25.6	24.2
CDC Kernem	48	93	24	46.8	52.8	29.5	26.0	--
CDC Neela	47	92	23	45.6	54.5	30.2	27.7	26.1
CDC Rowland	48	94	22	45.3	52.6	26.1	25.8	26.0
Gold ND ³	48	98	25	47.6	40.0	27.9	26.0	23.7
Lion	47	92	24	--	53.4	27.9	25.3	26.8
ND Hammond	46	94	24	45.6	50.9	28.1	24.3	22.6
Omega ³	45	92	23	45.8	53.1	28.6	23.2	19.7
Webster	47	94	25	46.6	52.9	27.7	25.7	24.7
York	46	96	23	44.7	52.2	31.9	26.3	24.1
Mean	47	94	24	46.2	52.7	28.3	25.6	24.0
CV %	2.3	3.0	8.6	2.6	2.7	10.5	--	--
LSD 0.05	1.5	3.9	2.8	1.7	2.0	2.7	--	--
LSD 0.10	1.3	3.3	2.4	1.4	1.7	2.2	--	--

Planted: May 11. Harvested: Aug. 30. Previous crop: durum.

¹Three-year average is for 2020, 2022 and 2023. Data is not available for 2021.²DAP = Days after planting.³Yellow seeded.**Table 5. 2023 Flax - Dickinson - Author, Glenn Martin.**

Variety	Days to Flower (DAP) ²	Days to Mature (DAP) ²	Plant Height (inch)	Oil Content (%)	Test Weight (lb/bu)	Seed Yield		
						2023	2-yr. Avg.	3-yr. Avg. ¹
						------(bu/a)-----		
AAC Bright ³	49	96	20	45.0	52.1	24.2	18.8	19.2
AAC Marvelous	49	95	20	44.7	53.2	28.4	19.7	--
Carter ³	47	95	22	43.8	54.0	27.6	19.0	19.3
CDC Dorado ³	46	94	21	44.0	53.0	25.8	17.5	17.6
CDC Glas	48	95	21	43.0	52.3	28.4	18.5	18.9
CDC Kernem	48	95	24	43.6	53.4	31.5	--	--
CDC Neela	48	95	22	43.2	52.9	29.0	20.6	21.3
CDC Rowland	49	96	21	43.8	53.4	28.5	19.7	--
Gold ND ³	48	95	22	44.2	53.8	29.1	21.3	20.5
ND Hammond	47	95	20	42.8	53.1	27.2	19.3	19.2
Omega ³	48	96	20	43.9	54.1	25.2	18.7	18.8
Webster	49	96	20	44.5	53.4	27.1	19.3	20.2
York	47	95	20	42.8	53.3	26.6	18.8	19.4
Mean	48	95	21	44.1	53.4	28.1	19.2	19.5
CV %	2.5	0.8	6.8	2.2	0.4	12.3	--	--
LSD 0.05	1.6	1.1	2.0	1.3	0.3	4.8	--	--
LSD 0.10	1.3	0.8	1.0	1.0	0.2	3.7	--	--

Planted: May 1. Harvested: Aug. 18. Previous crop: oat hay.

¹Three-year average is for 2020, 2021 and 2023. Data is not available for 2022.²DAP = Days after planting.³Yellow seeded.

Table 6. 2023 Flax - Langdon - Authors, B. Hanson, L. Henry and R. Duerr.

Variety	Days to Flower (DAP) ¹	Plant Height (inch)	Test Weight (lb/bu)	Seed Yield				
				2021	2022	2023	2-yr. Avg.	3-yr. Avg.
AAC Bright ²	52	31	47.0	21.0	62.4	31.9	47.1	38.4
AAC Marvelous	51	29	50.5	21.7	63.7	30.1	46.9	38.5
Carter ²	47	30	51.5	21.0	56.6	34.5	45.5	37.4
CDC Dorado ²	44	29	47.2	18.3	54.5	30.2	42.4	34.3
CDC Glas	52	30	48.4	21.1	64.7	28.1	46.4	38.0
CDC Kernen	47	31	46.0	--	57.2	22.9	40.1	--
CDC Neela	50	33	51.3	21.7	59.2	34.7	46.9	38.5
CDC Rowland	50	29	50.2	20.7	68.2	35.2	51.7	41.4
Gold ND ²	50	32	52.2	20.5	55.6	31.6	43.6	35.9
ND Hammond	49	32	49.2	21.0	58.4	31.4	44.9	36.9
Omega ²	45	31	51.8	20.9	50.1	31.0	40.5	34.0
Webster	49	30	50.4	23.1	58.7	30.6	44.6	37.5
York	51	33	51.2	20.4	63.4	34.7	49.1	39.5
Mean	50	31	50.7	21.3	57.9	31.3	45.4	37.5
CV %	2.6	5.6	2.1	5.0	5.0	8.3	--	--
LSD 0.05	2.1	2.8	1.7	1.4	4.7	5.6	--	--
LSD 0.10	1.7	2.4	1.5	1.2	4.0	4.7	--	--

Planted: May 31. Harvested: Oct. 15. Previous crop: soybean.

¹DAP = Days after planting.²Yellow seeded.**Table 7. 2023 Flax - Hettinger - Authors, J. Rickertsen and M. Wells.**

Variety	Days to Flower (DAP) ²	Plant Height (inch)	Oil Content (%)	Test Weight (lb/bu)	Seed Yield		
					2023	2-yr. Avg.	3-yr. Avg. ¹
AAC Bright ³	51	27	48.0	48.1	31.9	25.1	20.9
AAC Marvelous	52	27	46.9	49.5	29.9	23.9	--
Carter ³	49	27	45.6	49.7	27.9	23.2	20.2
CDC Dorado ³	46	24	47.0	49.7	30.9	24.5	21.0
CDC Glas	50	29	46.1	49.0	31.1	24.1	21.1
CDC Kernen	52	27	44.8	49.2	31.9	--	--
CDC Neela	51	26	45.8	50.0	35.8	26.7	23.1
CDC Rowland	53	27	45.5	49.6	34.3	25.9	--
Gold ND ³	52	29	46.5	50.1	30.0	23.6	20.4
ND Hammond	49	26	44.4	49.3	28.5	23.4	20.0
Omega ³	50	27	45.6	50.6	29.3	23.7	21.2
Webster	52	28	45.4	49.7	30.1	24.3	21.1
York	49	28	44.7	49.7	32.2	24.9	22.3
Mean	51	27	45.8	49.6	30.3	24.7	21.1
CV %	2.3	5.6	2.0	0.8	10.4	--	--
LSD 0.05	1.4	1.8	1.1	0.5	3.7	--	--
LSD 0.10	1.2	1.4	0.8	0.4	2.9	--	--

Planted: May 4. Harvested: Aug. 31. Previous crop: peas.

¹ Average of 2020, 2021 and 2023² Days after planting.³ Yellow seeded.

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