

A1105-21

North Dakota Flax

Variety Trial Results for 2021 and Selection Guide

Hans Kandel and Mukhlesur Rahman (NDSU Main Station); Glenn Martin (Dickinson Research Extension Center); John Rickertsen and Michael Wells (Hettinger Research Extension Center); Bryan Hanson, Lawrence Henry and Jewel Faul (Langdon Research Extension Center); Cameron Wahlstrom, Jerry Bergman, and Gautam Pradhan (Williston Research Extension Center).

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 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, 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 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. **The CVs for yield in 2021 tended to be higher than normal and data should be interpreted with caution.** 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 field work and data compilation.

We acknowledge support from AmeriFlax for the statewide flax variety trials and compilation and printing of data in the annual flax variety selection guide. The assistance given by many secretaries in entering data in respective portions of the document is very much appreciated. A special thank you goes to Lisa Johnson, Extension Plant Sciences secretary, for assisting in the compilation of this publication.

Table 1. Flax Variety Descriptions Tested in 2021 in North Dakota.

Table 2. Yield of Flax Varieties at Four Locations in North Dakota, 2019-2021.

Table 3. Test Weight and Oil Content of Flax Varieties at Three Locations in North Dakota, 2021.

Table 4. 2021 Flax - Dickinson.

Table 5. 2021 Flax - Langdon.

Table 6. 2021 Flax - Williston.

Table 7. 2021 Flax - Hettinger.

Table 1. Flax Variety Descriptions Tested in 2021 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	52	Yellow	18	MS/S ⁵
AAC Marvelous	Can.	2019	53	Brown	19	MR
Carter	ND	2004	52	Yellow	19	MS/S ⁵
CDC Buryu	Can.	2016	52	Brown	18	MR
CDC Dorado	Can.	2017	51	Yellow	17	MS5
CDC Glas	Can.	2012	53	Brown	18	MS ⁵
CDC Neela	Can.	2013	52	Brown	18	MR
CDC Plava	Can.	2015	53	Brown	17	MR
CDC Rowland	Can.	2018	53	Brown	18	MR
Gold ND	ND	2014	53	Yellow	19	MR/R
ND Hammond	ND	2018	52	Brown	18	MS
Omega	ND	1989	53	Yellow	18	MS ⁵
Webster	SD	1998	52	Brown	19	MR
York	ND	2002	52	Brown	18	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 Dickinson, Langdon, Williston and Hettinger, 2021

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, 2019-2021.

Variety	<u>Dickinson</u>		<u>Hettinger</u>		<u>Langdon</u>		<u>Williston</u>	<u>Average N.D.</u>	
	2021	3 Yr. Avg.	2021	3 Yr. Avg. ¹	2021	3 Yr. Avg.	3 Yr. Avg.	2021 ²	3 Yr. Avg.
	-----(bu/a)----		-----(bu/a)----		-----(bu/a)----		---(bu/a)---	-----(bu/a)----	
AAC Bright ³	13.4	15.7	18.3	--	21.0	36.8	14.2	17.6	--
AAC Marvelous	10.9	--	17.9	--	21.7	--	--	16.8	--
Carter ³	10.4	15.0	18.5	19.0	21.0	35.6	11.5	16.6	20.3
CDC Buryu	8.8	15.7	19.2	--	20.9	34.1	16.8	16.3	--
CDC Dorado ³	9.2	--	18.2	--	18.3	--	--	15.2	--
CDC Glas	8.6	13.8	17.1	18.7	21.1	37.4	14.9	15.6	21.2
CDC Neela	12.2	16.3	17.5	19.6	21.7	36.1	12.2	17.1	21.0
CDC Plava	10.1	12.8	18.0	--	20.9	33.1	18.5	16.3	--
CDC Rowland	10.8	--	17.5	--	20.7	--	--	16.3	--
Gold ND ³	13.4	15.5	17.3	17.7	20.5	36.5	11.5	17.0	20.3
ND Hammond	11.3	13.8	18.3	17.8	21.0	33.0	13.0	16.9	19.4
Omega ³	12.2	14.8	18.1	17.8	20.9	33.2	14.5	17.0	20.1
Webster	11.4	15.9	18.4	19.0	23.1	36.9	12.8	17.7	21.1
York	11.0	16.7	17.5	19.6	20.4	37.2	13.0	16.3	21.6
Mean	11.0	15.1	18.0	18.7	20.9	35.4	13.9	16.6	20.6
CV %	24.4	11.3	5.6	7.9	5.0	7.7	22.0	6.4	5.7
LSD 0.05	NS	2.9	1.2	NS	1.4	NS	5.2	1.8	1.7
LSD 0.10	NS	2.4	0.9	NS	1.2	3.8	4.3	1.5	1.4

¹Average of 2018, 2020 and 2021.²Average of Dickinson, Hettinger and Langdon 2021.³Yellow seeded.**Table 3. Test Weight and Oil Content of Flax Varieties at Three Locations in North Dakota, 2021.**

Variety	<u>Dickinson</u>		<u>Hettinger</u>		<u>Langdon</u>	<u>Average N.D.</u> ¹	
	Test Wt.	Oil	Test Wt.	Oil	Test Wt.	Test Wt.	Oil
	(lb/bu)	(%)	(lb/bu)	(%)	(lb/bu)	(lb/bu)	(%)
AAC Bright ²	52.5	43.9	49.3	42.5	51.0	51.0	43.2
AAC Marvelous	53.9	43.1	49.1	42.3	52.5	51.8	42.7
Carter ²	51.8	40.5	49.5	42.9	53.1	51.5	41.7
CDC Buryu	54.0	40.8	49.7	43.0	52.4	52.0	41.9
CDC Dorado ²	52.2	42.5	49.0	42.3	51.8	51.0	42.4
CDC Glas	52.3	41.9	49.2	41.9	51.2	50.9	41.9
CDC Neela	53.9	42.1	48.4	42.1	52.1	51.5	42.1
CDC Plava	52.9	42.3	48.5	42.9	52.1	51.2	42.6
CDC Rowland	53.8	41.3	48.9	41.8	52.5	51.7	41.6
Gold ND ²	54.1	42.4	49.8	42.9	53.0	52.3	42.7
ND Hammond	53.6	40.4	49.9	43.4	52.3	51.9	41.9
Omega ²	54.6	40.6	49.6	42.6	53.2	52.5	41.6
Webster	53.7	41.6	48.8	42.1	52.6	51.7	41.8
York	54.1	41.6	49.2	42.0	52.3	51.9	41.8
Mean	53.6	41.8	49.2	42.5	52.6	51.6	42.1
CV %	1.4	1.4	1.5	2.7	0.3	1.1	2.1
LSD 0.05	1.2	0.9	0.9	1.6	0.2	1.0	NS
LSD 0.10	1.0	0.8	0.7	1.4	0.2	0.8	1.6

¹Oil average of Dickinson and Hettinger 2021.²Yellow seeded.

Table 4. 2021 Flax - Dickinson - Author, G. Martin.

Variety	Days to	Days to	Plant	Oil	Test	Seed Yield				
	Flower	Mature	Height	Content	Weight	2019	2020	2021	2-yr. Avg.	3-yr. Avg.
	(DAP) ¹	(DAP) ¹	(inch)	(%)	(lb/bu)	------(bu/a)-----				
AAC Bright ²	57	91	16	43.9	52.5	13.6	20.1	13.4	16.7	15.7
AAC Marvelous	57	91	17	43.1	53.9	--	--	10.9	--	--
Carter ²	57	92	17	40.5	51.8	14.7	20.0	10.4	15.2	15.0
CDC Buryu	57	91	16	40.8	54.0	15.4	22.9	8.8	15.9	15.7
CDC Dorado ²	56	91	15	42.5	52.2	--	17.9	9.2	13.5	--
CDC Glas	57	91	15	41.9	52.3	13.3	19.7	8.6	14.1	13.8
CDC Neela	57	91	16	42.1	53.9	13.9	22.7	12.2	17.5	16.3
CDC Plava	57	90	15	42.3	52.9	9.9	18.4	10.1	14.3	12.8
CDC Rowland	57	92	15	41.3	53.8	--	--	10.8	--	--
Gold ND ²	57	92	18	42.4	54.1	14.1	19.1	13.4	16.3	15.5
ND Hammond	58	91	16	40.4	53.6	11.0	19.2	11.3	15.3	13.8
Omega ²	59	92	15	40.6	54.6	13.3	19.0	12.2	15.6	14.8
Webster	57	91	16	41.6	53.7	13.9	22.2	11.4	16.8	15.9
York	57	92	17	41.6	54.1	18.4	20.6	11.0	15.8	16.7
Mean	57	91	16	41.8	53.4	13.8	20.1	11.0	15.6	15.1
CV %	1.3	0.8	6.6	1.4	1.4	15.0	10.9	24.4	10.5	11.3
LSD 0.05	1.2	1.2	1.8	0.9	1.2	3.6	3.7	NS	NS	2.9
LSD 0.10	1.0	1.0	1.5	0.8	1.0	3.0	3.1	NS	NS	2.4

Planted: April 23. Harvested: Aug. 13. Previous crop: cover crop.

¹DAP = Days after planting.²Yellow seeded.**Table 5. 2020 Flax - Langdon - Authors, B. Hanson, L. Henry and J. Faul.**

Variety	Days to	Plant	Test	Seed Yield				
	Flower	Height	Weight	2019	2020	2021	2-yr. Avg.	3-yr. Avg.
	(DAP) ¹	(inch)	(lb/bu)	------(bu/a)-----				
AAC Bright ²	54	20	51.0	38.0	51.4	21.0	36.2	36.8
AAC Marvelous	53	20	52.5	--	--	21.7	--	--
Carter ²	52	21	53.1	42.3	43.4	21.0	32.2	35.6
CDC Buryu	52	19	52.4	41.6	39.7	20.9	30.3	34.1
CDC Dorado ²	51	19	51.8	--	37.6	18.3	28.0	--
CDC Glas	54	19	51.2	41.6	49.6	21.1	35.3	37.4
CDC Neela	53	20	52.1	43.2	43.4	21.7	32.5	36.1
CDC Plava	53	19	52.1	39.7	38.7	20.9	29.8	33.1
CDC Rowland	55	17	52.5	--	--	20.7	--	--
Gold ND ²	55	20	53.0	41.2	47.7	20.5	34.1	36.5
ND Hammond	52	21	52.3	38.4	39.5	21.0	30.3	33.0
Omega ²	54	19	53.2	38.5	40.2	20.9	30.6	33.2
Webster	52	21	52.6	42.0	45.5	23.1	34.3	36.9
York	53	20	52.3	43.2	47.9	20.4	34.1	37.2
Mean	53	20	52.3	40.9	43.7	20.9	32.3	35.4
CV %	0.7	4.0	0.3	5.8	5.2	5.0	9.7	7.7
LSD 0.05	0.6	1.1	0.2	3.9	3.9	1.4	6.9	NS
LSD 0.10	0.5	0.9	0.2	3.2	3.3	1.2	5.7	3.8

Planted: May 11. Harvested: Sept. 8.

¹DAP = Days after planting.²Yellow seeded.

Table 6. 2021 Flax - Williston - Authors, C. Wahlstrom, J. Bergman and G. Pradhan.

Cultivar	Days to Flower (DAP) ¹	Days to Maturity (DAP) ¹	Plant Height (inch)	Seed yield			
				2019	2020	2021	3-yr. Avg.
AAC Bright ²	48	77	19	21.5	14.9	6.2	14.2
AAC Marvelous	49	79	19	--	--	6.4	--
Carter ²	49	81	21	13.9	14.2	6.5	11.5
CDC Buryu	48	78	20	26.8	17.3	6.4	16.8
CDC Dorado ²	46	76	17	--	18.2	6.4	--
CDC Glas	50	77	20	21.4	16.3	7.0	14.9
CDC Neela	49	78	19	16.3	14.6	5.7	12.2
CDC Plava	48	79	18	28.8	19.9	6.9	18.5
CDC Rowland	50	80	20	--	--	6.1	--
Gold ND ²	50	80	21	14.0	12.7	7.7	11.5
ND Hammond	47	77	19	15.9	16.2	6.8	13.0
Omega ²	48	79	18	21.8	15.0	6.6	14.5
Webster	50	81	21	13.2	18.7	6.5	12.8
York	47	41	17	16.2	17.0	5.9	13.0
Mean	49	76	19	19.1	16.3	6.5	13.9
CV %	4.8	16.1	6.1	21.4	19.0	23.1	22.0
LSD 0.05	1.1	5.9	0.6	5.2	1.4	0.7	5.2
LSD 0.10	0.9	4.9	0.5	4.4	1.2	0.6	4.3

Planted: May 10. Harvested: Sept. 10. Previous crop: wheat.

¹DAP = Days after planting.²Yellow seeded.**Table 7. 2021 Flax - Hettinger - Authors, J. Rickertson and M. Wells.**

Variety	Days to Flower (DAP) ²	Plant Height (inch)	Oil Content (%)	Test Weight (lb/bu)	Seed Yield		
					2021	2-yr. Avg.	3-yr. Avg. ¹
AAC Bright ³	51	18	42.5	49.3	18.3	15.4	--
AAC Marvelous	51	19	42.3	49.1	17.9	--	--
Carter ³	51	19	42.9	49.5	18.5	16.3	19.0
CDC Buryu	51	18	43.0	49.7	19.2	16.2	--
CDC Dorado ³	51	19	42.3	49.0	18.2	16.0	--
CDC Glas	52	19	41.9	49.2	17.1	16.1	18.7
CDC Neela	50	18	42.1	48.4	17.5	16.8	19.6
CDC Plava	52	18	42.9	48.5	18.0	17.1	--
CDC Rowland	52	19	41.8	48.9	17.5	--	--
Gold ND ³	51	19	42.9	49.8	17.3	15.6	17.7
ND Hammond	51	17	43.4	49.9	18.3	15.7	17.8
Omega ³	51	19	42.6	49.6	18.1	17.2	17.8
Webster	51	17	42.1	48.8	18.4	16.6	19.0
York	52	18	42.0	49.2	17.5	17.4	19.6
Mean	51	18	42.5	49.2	18.0	16.4	18.7
CV %	2.1	7.1	2.7	1.5	5.6	8.0	7.9
LSD 0.05	1.5	1.8	1.6	0.9	1.2	NS	NS
LSD 0.10	1.3	1.5	1.4	0.7	0.9	NS	NS

Planted: May 5. Harvested: Aug. 12. Previous crop: pea.

¹Average of 2018, 2020 and 2021.²DAP = Days after planting.³Yellow seeded.

NDSU does not endorse commercial products or companies even though reference may be made to tradenames, trademarks or service names.

For more information on this and other topics, see www.ag.ndsu.edu

NDSU encourages you to use and share this content, but please do so under the conditions of our Creative Commons license. You may copy, distribute, transmit and adapt this work as long as you give full attribution, don't use the work for commercial purposes and share your resulting work similarly. For more information, visit www.ag.ndsu.edu/agcomm/creative-commons.

County commissions, North Dakota State University and U.S. Department of Agriculture cooperating. NDSU does not discriminate in its programs and activities on the basis of age, color, gender expression/identity, genetic information, marital status, national origin, participation in lawful off-campus activity, physical or mental disability, pregnancy, public assistance status, race, religion, sex, sexual orientation, spousal relationship to current employee, or veteran status, as applicable. Direct inquiries to Vice Provost for Title IX/ADA Coordinator, Old Main 201, NDSU Main Campus, 701-231-7708, ndsuoaa.ndsu.edu. This publication will be made available in alternative formats for people with disabilities upon request, 701-231-7881.