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Extension Extra

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South Dakota Flax Variety Evaluations 2003

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The success of flax production is affected by choice of variety. Carefully examine variety characteristics such as seed yield, oil content, and maturity. In some cases oil content or maturity may offset a yield advantage.

Yield

Evaluate as much yield data as possible, looking at relative performance over many locations and years. For example, in this publication, variety comparisons from 3 years and five locations are better than those from a single year or location. Consistently good performance over many environments is called “yield stability.”

Good yield stability means that a variety may or may not be the best yielder at all locations, but it does rank high in yield potential at many locations. A variety that ranks in the upper 20% over all locations exhibits better yield stability than one that is the top yielder at two locations but ranks in the lower 40% at two other locations.

Table 1 presents flax yield data from 2003 (or the most recent year for which data are available) for several sites in South Dakota. Three-year and statewide yield averages are also provided. Table 2 summarizes the characteristics of the varieties included in the performance trials.

To determine if one variety is better than another for a given trait, use the least significant difference (LSD.05) value at the bottom of each data column. The LSD value is a statistical way to indicate if a trait like yield differs when comparing two varieties. If two varieties differ by more than the indicated LSD value for a given trait, they will likely differ when grown again under highly similar conditions.

For example, if the trial at Webster could be repeated exactly as it was in 2003 (see Table 1), the yield ranking of AC

Emerson (35.6 bu/A) and AC Watson (30.8 bu/A) might change places since their yield difference (4.8 bu/A) is less than the indicated LSD value of 5.5 bu/A. However, we would expect AC Emerson (35.6 bu/A) to yield more than Cathay (29.2 bu/A) if the test was repeated since their yield difference (6.4 bu/A) is greater than the indicated yield LSD value of 5.5 bu/A.

In Table 1, the minimum yield of varieties in the top-yielding group at a particular location is at the bottom of each data column (when significant differences in yield were measured). Any variety meeting or exceeding this minimum yield value differed by less than the LSD.05 value from the highest-yielding variety in the test and is therefore considered to be in the top-yielding group. For example, in the 2003 trial at Webster there were 12 varieties in the top-yield group. Numerically, AC Emerson had the highest yield (35.6 bu/A). However, 11 other varieties were also in the top-yield group because their yields were within one LSD value (5.5 bu/A) of AC Emerson.

If the LSD.05 value is indicated as ‘ns,’ there were no statistically significant differences in yield among the varieties. In other words, the variety yields were all close enough to each other to be essentially the same, considering the amount of error inherent in the test.

When evaluating yield, look at as many trials as possible. It is unlikely that the environmental conditions of a test will repeat in any future year.

The coefficient of variability (C.V.) listed at the bottom of the data table is a relative measure of the precision or reliability of a test. Generally, trials with low C.V. rates are more reliable for making variety choices than trials with higher C.V. rates. Trials with C.V. rates not exceeding 15-20% may be considered reliable.

Oil Content

Among varieties with similar yield potential, select the one with the highest oil content.

variety will mature properly and exhibit its best yield potential and oil content.

Maturity

Later-maturing varieties generally will produce higher yields than early varieties when seeded at normal planting dates. Maturity is particularly important if planting is delayed. In many cases of late seeding only an early

Seed Availability and Quality

Seed sources for Canadian and some older flax varieties may be limited. Be sure to plant only high quality seed with good germination. Certified seed is recommended to assure varietal purity, viability, and freedom from pathogens and weed seed.

Table 1. 2003 and three-year average flax yields(bu/A) at several locations in South Dakota.

Variety	Origin -Year	Brookings Early-Seeded		Brookings Late-seeded		Watertown		Webster		Highmore	Statewide		State- wide Rank	Yield* Stability
		2000	3-yr	2003	3-yr	2002	3-yr	2003	3-yr	2003	2003	3-yr		
			-3-		-4-		-3-		-3-		-3-	-14-		
AC Carnduff	CAN-99	28.2	21.8	18.9	13.1	15.5	16.1	31.7	22.4	23.6	24.8	19.0	2	8/14
AC Emerson	CAN-95	29.5	21.2	18.2	14.8	11.0	12.7	35.6	20.0	20.8	25.3	17.7	18	11/14
AC Hanley	CAN-02	--	--	18.2	--	11.7	--	30.9	--	16.3	22.4	17.6	20	5/6
AC Watson	CAN-97	25.4	17.0	16.6	14.8	12.8	13.0	30.8	24.2	22.2	23.2	17.9	15	9/14
Cathay	ND-97	26.2	19.1	18.9	13.2	13.9	14.1	29.2	23.2	18.8	22.7	17.9	15	5/14
CDC Arras	CAN-00	31.7	20.8	23.1	14.7	13.8	13.1	31.8	24.2	19.5	25.4	18.6	6	9/14
CDC Bethume	CAN-00	27.8	18.7	19.7	15.4	12.3	12.9	30.8	23.3	21.0	24.1	18.1	12	9/14
CDC Mons	CAN-03	--	--	15.7	--	--	--	30.6	--	--	--	--	--	2/2
CDC Normandy	CAN-96	25.7	18.4	24.0	14.5	12.3	14.4	29.8	21.9	21.5	25.5	18.2	11	5/14
CDC Valour	CAN-97	25.6	17.5	18.0	12.3	13.3	15.9	26.3	18.7	18.2	21.1	16.6	22	6/14
Day	SD-90	32.3	21.2	19.1	14.7	12.5	14.2	27.4	21.6	20.4	22.5	18.3	9	9/14
Linora	CAN-92	26.5	20.4	26.8	14.2	12.3	15.6	29.0	24.0	19.5	25.7	19.4	1	8/14
Linott	CAN-66	28.1	18.9	18.9	13.6	13.4	14.1	26.9	21.5	21.0	22.3	17.7	18	6/14
McGregor	CAN-82	28.7	17.8	20.7	14.3	9.9	10.7	28.1	23.0	17.4	22.6	16.9	21	5/14
Neché	ND-88	33.0	21.0	19.4	13.8	13.1	14.8	32.3	25.2	18.5	23.9	19.0	2	8/14
Nekoma	ND-02	--	18.5	23.5	14.6	11.6	16.8	28.6	21.7	18.8	24.2	18.3	9	6/14
Omega	ND-90	28.8	21.4	18.9	14.0	14.1	13.8	30.1	24.3	19.5	23.1	18.7	5	9/14
Pembina	ND-97	25.8	17.7	22.3	13.6	10.2	12.6	26.3	21.2	14.3	21.7	16.4	23	4/14
Prairie Blue	CAN-03	--	--	20.6	--	11.0	--	29.0	--	21.6	23.9	--	--	3/4
Prompt	SD-89	24.0	18.7	21.6	15.1	10.9	15.1	25.5	20.9	19.8	22.5	18.1	12	8/14
Rahab 94	SD-94	27.2	17.7	22.0	15.1	10.6	14.5	33.8	22.8	19.0	25.6	18.0	14	7/14
Selby	SD-00	27.5	18.3	22.7	14.5	15.1	16.3	26.3	22.6	20.6	23.5	18.6	6	8/14
Verne 93	SD-93	26.4	19.9	21.5	15.1	14.2	16.6	27.2	22.3	20.3	23.2	19.0	2	8/14
Webster	SD-98	31.6	18.9	20.4	13.0	14.6	16.6	29.4	22.1	17.1	22.8	17.8	17	7/14
York	ND-02	28.2	21.2	23.4	16.3	12.6	14.2	29.6	21.3	17.2	24.1	18.5	8	8/14
Experimentals														
N0010	ND-exp.	--	--	15.3	--	12.2	--	32.0	--	19.3	22.5	18.8	--	5/6
FP1096	CAN-exp.	--	--	20.0	--	12.4	--	30.5	--	20.7	24.0	17.2	--	5/6
N0009	ND-exp.	--	--	21.5	--	14.0	--	26.7	--	20.4	23.1	--	--	3/4
Grand Mean		27.8	19.4	20.4	14.3	12.6	14.4	29.6	22.4	19.5	23.5	18.1		
LSD.05		4.2	ns [^]	ns	ns	ns	ns	5.5	ns	3.9	ns	ns		
Minimum yield of top group		28.8	ns	ns	ns	ns	ns	30.1	ns	19.7	ns	ns		
C.V.		9.3	12.0	14.6	13.9	16.0	15.6	11.4	14.2	9.7	13.3	13.9		

* Yield stability = number of times in top yield group/total number of tests.

[^] ns = there were no significant differences in yield among the varieties.

Table 2. Characteristics of flax varieties.

Variety	Origin -Year	Days to Flower	Seed Size	Color		Statewide Averages				Lodging (1-9)*	Disease Resistance	
				Flower	Seed	Oil %	Height (cm)	Yield (bu/A)			Wilt	Rust
		-3-			-11-	-13-	-3-	-14-	-3-			
AC Carnduff	CAN-99	51	Small	Blue	Brown	39.4	49	24.8	19.0	3	MR	R
AC Emerson	CAN-95	50	Medium	Blue	Brown	38.8	50	25.3	17.7	5	R	R
AC Hanley	CAN-02	50	Small	Blue	Brown	37.4	45	22.4	17.6	--	MR	R
AC Watson	CAN-97	48	Med-Lg	Blue	Brown	39.2	48	23.2	17.9	4	MS	R
Cathay	ND-97	51	Medium	Blue	Brown	40.1	53	22.7	17.9	1	R	R
CDC Arras	CAN-00	51	Medium	Blue	Brown	39.7	51	25.4	18.6	6	R	R
CDC Bethume	CAN-00	51	Medium	Blue	Brown	40.1	52	24.1	18.1	2	MR	R
CDC Mons	CAN-03	--	--	Blue	Brown	--	--	--	--	--	--	R
CDC Normandy	CAN-96	48	Med-Sm	Blue	Brown	38.9	51	25.5	18.2	4	MR	R
CDC Valour	CAN-97	46	Medium	Blue	Brown	38.8	46	21.1	16.6	5	S	R
Day	SD-90	47	Small	Blue	Brown	40.4	49	22.5	18.3	3	MR	R
Linora	CAN-92	48	Med-Sm	Blue	Brown	39.7	50	25.7	19.4	3	MR	R
Linott	CAN-66	47	Med-Sm	Blue	Brown	39.6	51	22.3	17.7	4	MS	R
McGregor	CAN-82	53	Medium	Blue	Brown	38.6	52	22.6	16.9	2	MR	R
Neche	ND-88	49	Small	Blue	Brown	39.8	51	23.9	19.0	2	MS	R
Nekoma	ND-02	50	Med-Sm	Blue	Brown	40.1	51	24.2	18.3	1	MR	R
Omega	ND-90	49	Medium	Blue	Yellow	39.8	50	23.1	18.7	3	MS	R
Pembina	ND-97	51	Med-Sm	Blue	Brown	39.5	52	21.7	16.4	2	R	R
Prairie Blue	CAN-03	--	--	Blue	Brown	--	--	23.9	--	--	MR	R
Prompt	SD-89	44	Small	Blue	Brown	39.4	47	22.5	18.1	2	MR	R
Rahab 94	SD-94	51	Medium	Blue	Brown	40.1	49	25.6	18.0	1	MR	R
Selby	SD-00	51	Medium	Blue	Brown	40.3	53	23.5	18.6	2	MR	R
Verne 93	SD-93	47	Med-Sm	Blue	Brown	39.9	51	23.2	19.0	3	R	R
Webster	SD-98	52	Med-Sm	Blue	Brown	39.9	55	22.8	17.8	3	MR	R
York	ND-02	52	Medium	Blue	Brown	39.3	49	24.1	18.5	2	MR	R
<u>Experimentals</u>												
N0010	ND-exp.	48	Small	Blue	Yellow	39.2	49	22.5	18.8	--	S	R
FP1096	CAN-exp.	51	Medium	Blue	Brown	40.3	51	24.0	17.2	--	MR	R
N0009	ND-exp.	--	--	Blue	Yellow	--	--	23.1	--	--	MS	R
Grand Mean		50				39.5	50	23.5	18.1	3		
LSD.05		2				0.6	2	ns	ns	2		
C.V.		2.6				1.8	4.8	13.3	13.9	40		

* Lodging rated on a scale of 1 to 9, where 1=no lodging and 9=flat.



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