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2006 South Dakota Flax Variety Evaluations

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South Dakota Flax Variety Evaluations 2009

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The success of flax production is affected by choice of variety. Variety characteristics such as seed yield, oil content, disease resistance, and maturity should be examined carefully when deciding which variety or varieties to plant. In some cases oil content or other traits may offset a yield advantage.

YIELD

Evaluate as much yield data as possible when selecting a variety, looking at relative performance over many locations and years. For example, variety comparisons over 3 years are better than those from a single year or location. A consistent performance of a variety 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 ranks 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.

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.

If the LSD.05 value is indicated as "ns," it means that 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 variation inherent in the test.

When evaluating yield, look at as many trials as possible. Trial results from neighboring states are readily available and provide additional data on variety performance. 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 of 15-20% or less may be considered reliable.

OIL CONTENT

Among varieties with similar yield potential, select the one with the highest oil content. It does not pay to sacrifice yield for oil content, however.

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

DISEASE RESISTANCE

The two most serious flax diseases are wilt and rust. Currently, all commercially grown flax varieties are resistant to race 371 of the flax rust pathogen Melampsora lini. This is the most common naturally occurring rust race in North America. Flax wilt is caused by Fusarium oxysporum f. sp. lini, a soil-borne pathogen that can infect plants at any stage of development. It may cause wilting and death of seedlings or older plants, stunting, loss of vigor, and reduced yield. Flax varieties differ in their resistance to flax wilt. If flax is grown in a field with a history of wilt, a wilt-resistant variety should be selected. A fungicide seed treatment will provide early protection to infection by seed-borne and soil-borne organisms that cause seedling blight and damping-off.

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, seed viability, and freedom from pathogens and weed seed.

2009 TRIAL PROCEDURES

A yield trial of flax varieties and experimental lines from South Dakota, North Dakota, and Canada was grown at Brookings, S.D., in 2009. The purpose of the trial was to provide performance data on released flax varieties to producers and compare performance of experimental lines to established checks in order to identify possible new varieties.

In 2009, five experimental lines from the NDSU or Canadian flax breeding programs were tested against 17 released varieties. The trial was planted on May 19, 2009. The previous crop was oats. Experiment design was a randomized complete block with three replications. Plots consisted of seven rows 20 ft. long, with rows spaced 7 inches apart. Plots were harvested by cutting the middle three rows of each plot with a bundle cutter, then drying and threshing the bundles. Oil content was determined with a Bruker minispec NMR on oven-dried 35 ml seed samples from each plot. Oil contents were adjusted to 10% moisture basis.

Table 1 shows 2009, 2-, and 3-year average yield, oil, flowering, and height data for flax grown at Brookings, S.D. Table 2 summarizes the characteristics of the varieties included in the performance trials. Yields at Brookings in 2009 averaged 26.7 bu/acre with 39.7% oil.

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Table 1. 2009 Flax Variety Trial, Brookings, S.D.

Variety	Origin -Year-	Seed Yield			Oil			Flower		Plant Height		
		2009	2-yr	3-yr	2009	2-yr	3-yr	2009	2-yr	2009	2-yr	3-yr
		(bu/ac)			(%)			(days)		(inches)		
AC Hanley	CAN-02	26.1	21.1	19.2	38.5	38.2	38.8	52	52	23.2	21.4	19.7
Bison	ND-27	28.2	19.8	19.9	38.7	38.3	39.0	47	49	23.6	22.4	20.6
Carter	ND-05	26.4	19.9	19.1	39.9	39.2	39.8	52	54	24.4	23.4	21.1
CDC Arras	CAN-00	19.4	18.3	17.1	39.4	38.9	39.4	51	53	24.8	23.4	21.2
CDC Bethune	CAN-00	19.5	16.9	16.5	39.2	38.7	39.4	51	53	25.2	24.1	21.7
CDC Sorrel	CAN-07	25.8	20.2	–	38.8	38.8	–	53	55	27.2	24.8	--
Linott	CAN-66	23.2	19.1	18.7	38.5	38.6	39.4	50	53	24.0	23.3	21.1
McGregor	CAN-82	25.4	21.2	20.2	38.2	38.0	38.6	53	54	24.0	23.0	21.1
Nekoma	ND-02	28.9	21.8	20.4	39.2	39.3	40.3	51	52	24.4	23.0	20.5
Omega	ND-90	23.3	19.2	18.8	40.7	39.9	40.5	49	51	20.9	20.4	19.1
Pembina	ND-97	28.0	22.5	19.6	39.0	39.0	39.7	53	53	25.2	23.4	21.3
Prairie Blue	CAN-03	31.8	23.8	21.4	40.1	39.9	40.5	53	53	26.4	23.4	21.1
Prairie Grande	CAN-08	24.8	20.3	--	41.0	39.9	–	46	48	19.3	18.9	--
Prairie Thunder	CAN-08	32.6	25.1	22.2	39.9	39.5	40.0	50	50	21.3	20.5	19.0
Rahab 94	SD-94	30.8	23.1	20.0	39.6	39.3	40.2	52	53	24.4	22.1	19.8
Selby	SD-00	32.7	23.5	21.6	39.0	38.8	39.8	52	54	24.4	23.1	21.3
Webster	SD-98	28.5	23.2	20.6	39.3	39.4	40.2	53	54	27.6	25.7	23.2
Experimentals												
A603	ND-exp.	23.9	18.4	--	39.3	38.7	–	51	54	23.6	21.7	–
FP2188	CAN-exp.	24.1	22.5	--	43.3	43.0	–	48	50	22.8	22.8	–
FP2214	CAN-exp.	24.4	21.4	--	42.1	41.8	–	49	51	24.0	22.0	–
N06 2055	ND-exp.	30.9	26.4	--	39.4	39.7	–	53	54	25.2	24.4	–
N06 2059	ND-exp.	27.9	20.2	--	40.2	40.0	–	52	54	27.6	25.0	–
Mean		26.7	21.3	19.7	39.7	39.4	39.7	51.0	52	24.2	22.8	20.8
LSD .05		ns[1]	4.2	3.0	0.6	0.6	0.5	1.1	1	2.1	1.6	1.1
C.V.		16.5	17.2	16.2	0.9	1.3	1.3	1.3	1.6	5.3	6.2	5.7

1 ns indicates that differences among the varieties were not statistically significant.

Seeding dates: 2009 – May 19th; 2008 – May 8th; 2007 – no trial; 2006 – April 26th

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Table 2. Flax Variety Characteristics

Variety	Origin -Year-	2-yr Days to Flower	Seed Size	Color		Disease[1] Resistance	
				Flower	Seed	Wilt	Rust
AC Hanley	CAN-02	52	Med-Sm	Blue	Brown	MR	R
Bison	ND-27	49	Med-Lrg	Blue	Brown	MR	S
Carter	ND-05	54	Med-Sm	Blue	Yellow	MS	R
CDC Arras	CAN-00	53	Med-Lrg	Blue	Brown	R	R
CDC Bethune	CAN-00	53	Medium	Blue	Brown	MR	R
CDC Sorrel	CAN-07	55	Med-Lrg	Blue	Brown	MR	R
Linott	CAN-66	53	Medium	Blue	Brown	MS	R
McGregor	CAN-82	54	Small	Blue	Brown	MR	R
Nekoma	ND-02	52	Med-Sm	Blue	Brown	S	R
Omega	ND-90	51	Medium	Blue	Yellow	MS	R
Pembina	ND-97	53	Large	Blue	Brown	R	R
Prairie Blue	CAN-03	53	Small	Blue	Brown	MR	R
Prairie Grande	CAN-08	48	Medium	Blue	Brown	MR	R
Prairie Thunder	CAN-08	50	Medium	Blue	Brown	R	R
Rahab 94	SD-94	53	Medium	Blue	Brown	MR	R
Selby	SD-00	54	Medium	Blue	Brown	MR	R
Webster	SD-98	54	Med-Lrg	Blue	Brown	MR	R
Experimentals							
A603	ND-exp.	54	Med-Sm	Blue	Brown	--	--
FP2188	CAN-exp.	50	Medium	Blue	Brown	--	R
FP2214	CAN-exp.	51	Medium	Blue	Brown	MR	R
N06 2055	ND-exp.	54	Large	Blue	Yellow	--	--
N06 2059	ND-exp.	54	Large	Blue	Yellow	--	--

[1] R = resistant; MR = moderately resistant; MS = moderately susceptible; S = susceptible.

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