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“SHORT SEASON FLAX”

Flax Day – Growing Flax First
Saskatchewan Flax Development Commission

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Linum (Flax) Research Program Leader

The Issue

Flax requires more Growing Degree Days than most other crops

Barley…1269……79%

Canola…1432 (to swath)….89%

Oats…..1483……93%

Wheat….1538……96%

Flax…..1603 (to swath)…100%

Data from Stu Brandt, AAFC Scott, SK

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Growing Degree Days

Measure of heat accumulation during the growing season.

The daily high temperature + the daily low temperature divided by 2

Subtract by the base temperature

(0 degrees for flax)

Miller, Lanier and Brandt 2001

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Flax Life Cycle

45 day to 60 day vegetative period
15 day to 25 day flowering period
30 day to 40 day maturation period

Total requirement; 90 day to 125 days

Canola has a shorter vegetative period and a longer flowering period...S. Brandt

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The Project

Short Season, High Quality Flax Development for the Peace Region of Alberta and British Columbia

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Partners and Funding

Alberta Agriculture and Food

British Columbia Grain Producers Association

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Funding; Advancing Canadian Agriculture and Agri-Food (ACAAF) Program

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The Experiment

Genetics

40 earliest accessions from Plant Gene Resources of Canada (Dr. Axel Diederichsen)

147 cold tolerant Linola strains from Viterra's program

8 checks including Noralta and CDC Bethune

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The Experiment

Locations

- **Fort St. John, BC...BCGPA...Clair Langois**
- **Dawson Creek, BC....BCGPA...Clair Langois**
- **Fairview, AB.....Peace Ag R&D...H. Vos**
- **Vegreville, AB.....Viterra...S. McEachern**

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Start-Up Issues...

Project approval was delayed and as such logistics were less than ideal

Seed for the field trials were grown in California during winter of 2006/07 and as such, seed was sent out to co-operators in the middle of May

Wet weather during mid-May in the Peace River region delayed seeding till the end of May

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Results...

All locations completed data collection and harvest

CV's were high for all tests

Data parameters included vigour, days to flower, days to maturity, lodging, height, seed yield, seed weight, oil content, fatty acid profile, iodine value, seed protein and meal protein

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Earliest Flax Strains

Entries	DTM	Days (+ / - NL)
1 (PGRC)	98	-7
1 (PGRC)	100	-5
1 (Cold tol. Linola)	102	-3
5 (Cold tol. Linola)	103	-2
7 (Cold tol. Linola)	104	-1
2 (PGRC)	104	-1
11 (Cold tol. Linola)	105	0
1 (PGRC)	105	0
NorLin	105	0
Noralta	106	+1
CDC Bethune	109	+4

Average of 4 locations

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Growing Degree Days in 2007

		May	June	July	Aug	Total	%
Dawson Creek		279	418	527	386	1610	(100%)
Ft. St. John	299	434	557	404	1694		(105%)
Peace River	291	444	557	410	1702		(106%)
Vegreville	320	441	605	427	1793		(112%)
Saskatoon		349	450	652	481	1932	(121%)
Morden		394	540	678	562	2174	(136%)

1603 GDD to mature flax
Peace River closest centre to Fairview, AB
Data from Environment Canada

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Maturity of Checks

		Days to Maturity			
Variety	Veg	Fairview	FSJ	DC	
Noralta	88	98	119	118	
NorLin		91	99	117	117
P. Grande		93	104	116	117
Bethune		95	103	123	125
GDD		1793	1702	1694	1610
GDD(% DC)		111	106	105	100
Latitude		53	56	56	55

Peace River closest centre to Fairview, AB

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Location, Location, Location

The earliest 25 entries from the average of all four locations were identified

Location	# Entries in Earliest 25
Dawson Creek	10
Ft. St. John	10
Fairview	9
Vegreville	12

Growing Degree Days in 2007

	May	May-Sept Total	May as % Total GDD	1 week Earlier Maturity	1 week Earlier (% Total GDD)
Dawson Creek	279	1610	17%		4%
P. River	291	1702	17%		4%
Vegreville	320	1793	18%	5%	
Morden	394	2174	18%		7%
Saskatoon	349	1932	18%		6%

Peace River closest centre to Fairview

Data from Environment Canada

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Recommendations

1. Early maturity would benefit farmers across the northern edge of the Prairies, western Alberta and the Peace River Region.
2. Cold tolerance (seedling vigour and frost tolerance) may be more important than earliness.
3. That the project be continued, but modified to involve a two-prong approach; breeding and agronomy. Five year project.
4. Large early generation, segregating populations could be generated and screened at Vegreville.

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Recommendations

5. Short-season, agronomic best practices need to be determined as part of this project. These practices need to determine the importance of;

   A. Very firm, moist seedbed.
   B. Seeding depth...0.5 inch (warmer soil)
   C. Very early seeding...late April vs mid May
   D. Seeding rate...45 pounds per acre
   E. Seed treatment

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Recommendations

6. Agronomy experiments to determine agronomic best practices should be developed on early maturing, cold tolerant flax lines that were identified in the 2007 field trials.

7. The end result would be cold tolerant, early maturing flax varieties along with agronomic best practices.

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