

Industrial hemp agronomy: Northern Prairie focus

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Vegreville

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Whitecourt - April 4, 2017

Establishing hemp as a mainstream crop for industrial applications

- Hemp fibre has great potential to be a valuable feedstock for several well established industries.

To realize potential residing within this crop InnoTech Alberta assembled a program offering solutions from **“Seed to final product”**

- Feedstock development
- Fibre processing
- Biocomposite research
- Market development



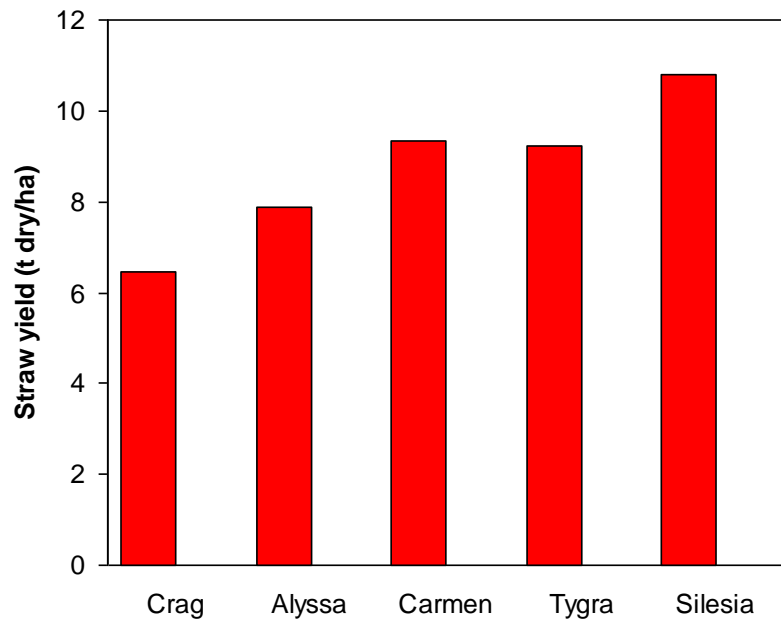
Feedstock development research goals

To **secure supply** of fibre of uniform quality and quantity and to **reduce costs** of fibre production



Hemp selection and breeding

- Germplasm evaluation
- Selection of top performers under AB conditions
- Maintenance breeding of cv. Silesia
- Initiation of new cultivars breeding for Alberta



InnoTech Alberta Agronomy Trials

Objective:

Optimization of cultivation practices for Alberta (at the Vegreville site)

- Seeding dates (mid May- mid June)
- Seeding densities (100 and 250/300 seed/m²)
- Fertilizers (cattle manure, mineral)
- N rates and forms (ammonia, urea)
- Harvest dates (for juvenile fibre)
- Herbicide resistance

ACIDF supported 3 y trials at Lethbridge, Vegreville and Falher

- Final report will be available in March 2018

Hemp varieties in Alberta

Variety	2014	2015	2016
Finola	7403	5751	4525.42
X59	1471	2994	3217.44
CFX2	1394	969	828.4
CRS1	65	0	0
Katani	0	108	745.15
Grandi	0	64	199.7
Piccolo	0	54	3416.83
Other	10	0	4.4
Total	10343	9940	12937.34

Seedbed preparation

- Hemp is very sensitive to soil structure; yield penalty on compacted soils
- Does not tolerate soils with poor drainage



Water logging - 2016 Falher

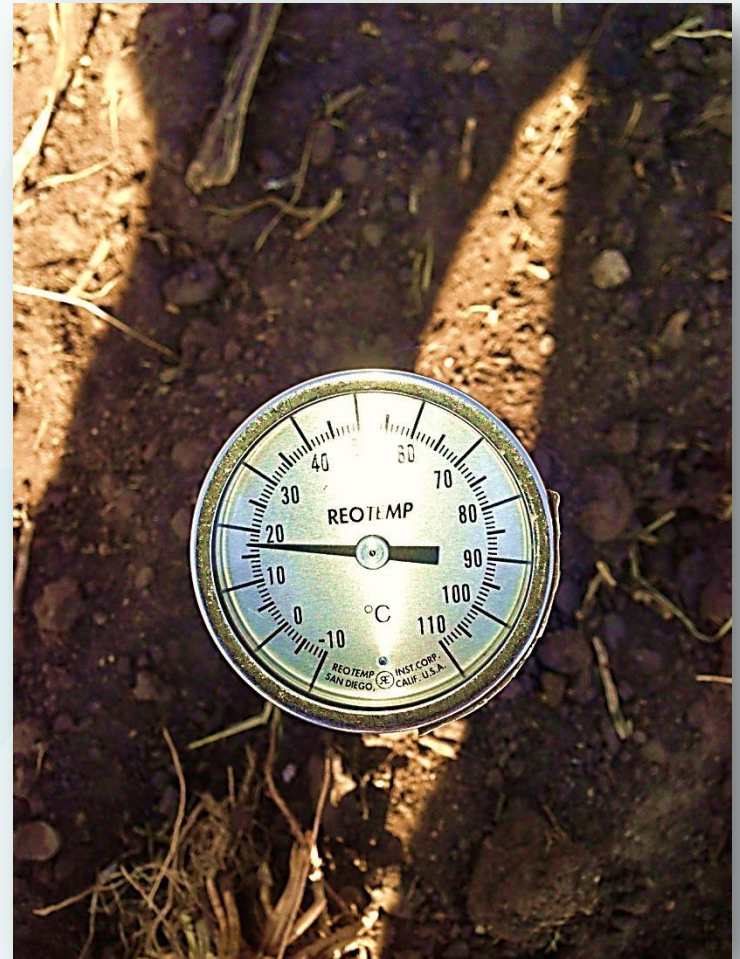


Water logging – 2016 Vegreville



Seeding

- Seed shallow - $\sim \frac{1}{2}$ inch (or into moisture)
- 20-25 lbs/acre seeding rate for grain
- 40-60 lbc/ac for fibre
- Warm soils – above 8°C
- Equipment – low fan speed for air seeders



Drought on slopes



Fertilization

- Present rule of thumb:
“As much nitrogen as I can afford”
- Otherwords – N as for high protein wheat or canola
- Our ongoing research will verify this recommendations



Pests and diseases

- Sclerotinia - avoid rotation with canola
- Botrytis (grey mold)

Insects – not a real problem

- Bertha armyworm
- Cutworm
- Grasshoppers



Roundup drift



Spring frost

- Hemp is fairly resistant to spring frost



-4.7°C on May 30, 2015



Hail injuries

- Extent of damage depends on:
 - plant stage
 - usage type
- Symptoms - leaf shredding, stem bruising, kinking and/or breaking of stalks, loss of flower heads



Recovery from hail injury

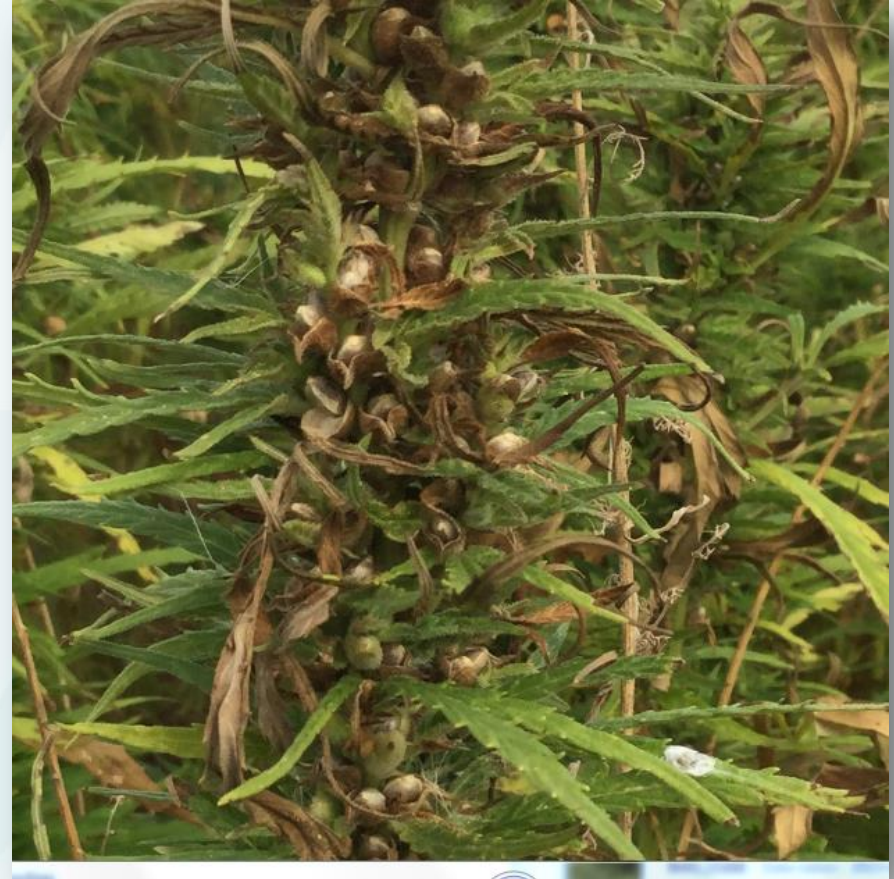


Birds – grain contamination



When to harvest grain?

Seeds begin to become exposed outside the protective bract



Harvesting grain (and fibre)

- Harvest at 85% seed maturity (12-20 % moisture)
- Wrapping is a problem
- Newer rotary combines work better than conventional
- Swathing is possible (in southern AB)



Harvesting fibre

- Easier than grain
- For high quality fiber – soon after pollen is shed (70-90 DAS)
- For biocomposites can be harvested at seed maturity



Retting

A process of beginning to separate the bast fibres from the hurds

- Types: field – dew retting, tank retting, enzymatic/chemical
- Length of field retting – 4-6 weeks to complete
- Critical for optimum fibre yield and quality



Baling



Grain storage

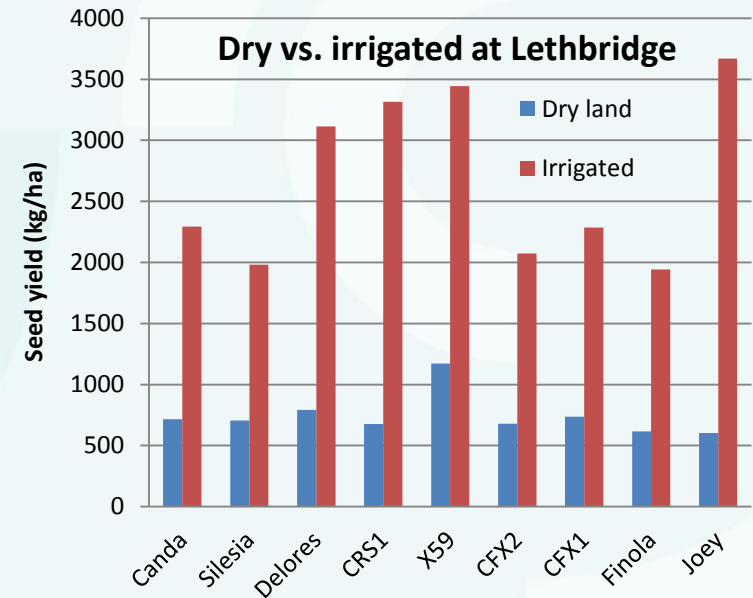
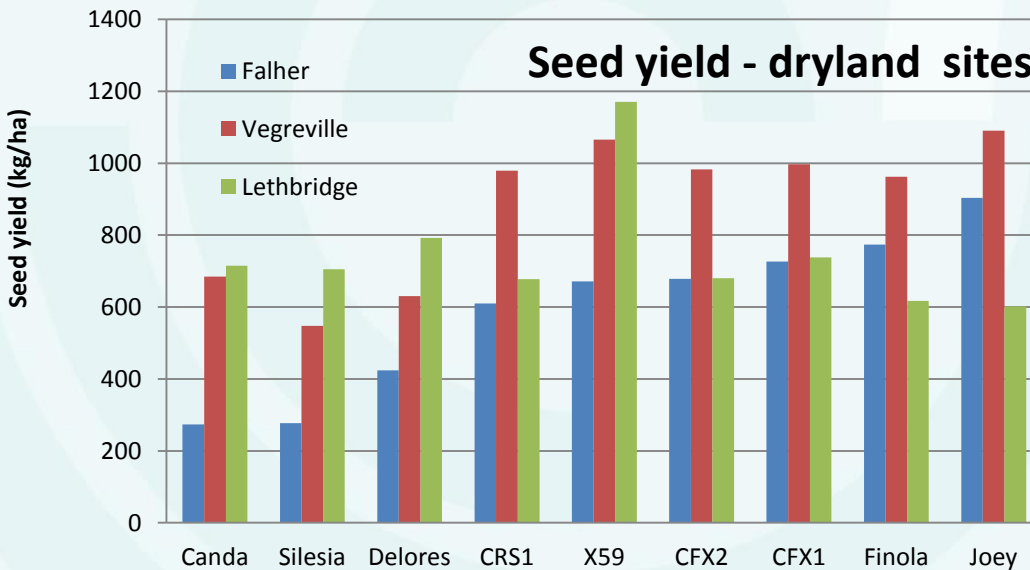
- Depends on variety, hemp is harvested at 12 - 20% seed moisture
- Start drying immediately (same day) after combining
- Slow speed augers (avoid cracking)
- Use high capacity fans, turn if moisture over 15%
- Do not overheat (oil will get rancid) <math><45^{\circ}\text{C}</math> plenum
- Long term storage at 8-10% moisture



Attainable yields – AB trials

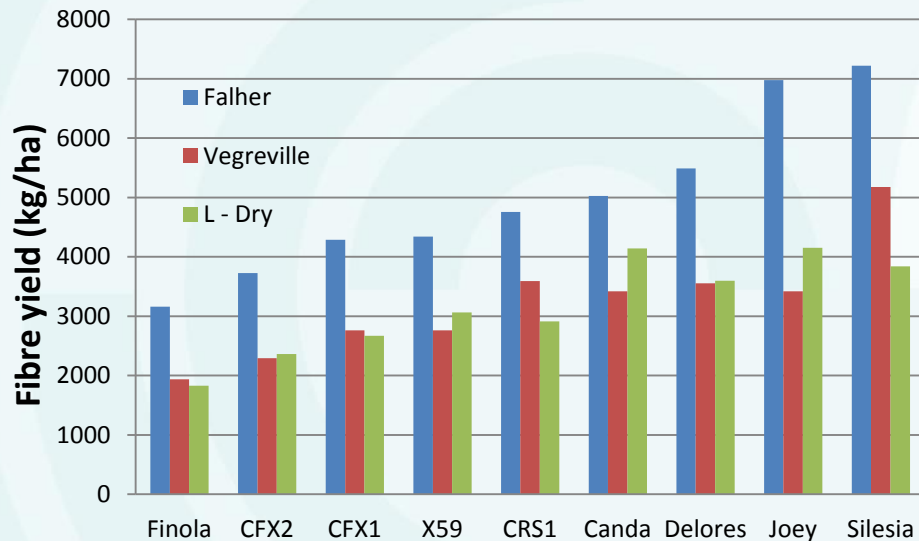
Yield range in commercial conventional dryland production:

- Grain - 100-1500 kg/ha
- Fibre - 1000-12000 kg/ha

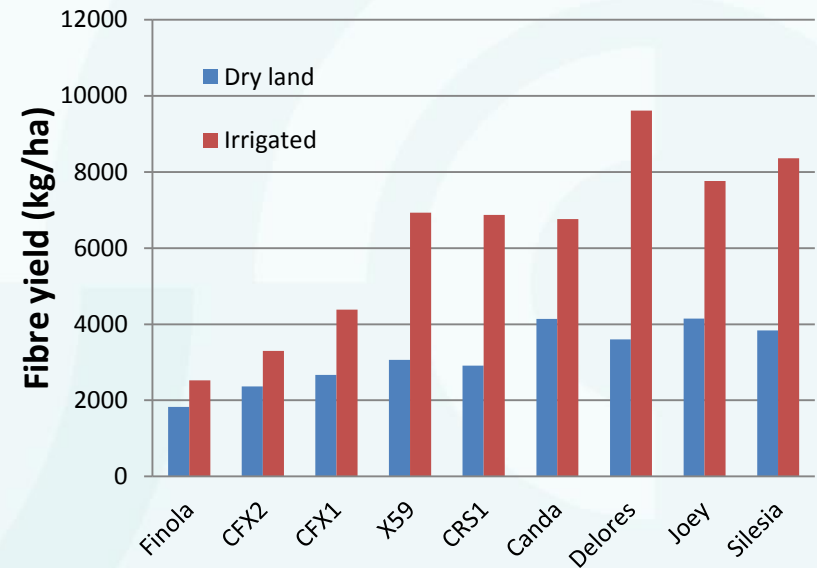


Fibre yields across Alberta

Fibre yield - dryland sites



Dry vs. irrigated at Lethbridge



- High fibre yields in the northern portion of the province
- Irrigation increases fibre yield of dual purpose cultivars

Fibre processing

- Decortication – separation of hemp stem



Bast



Hurd

Hemp – a crop like no other

- Farmers know how to grow staple crops in Alberta (wheat, canola, barley)
- Hemp is different - you have to know what are you growing for and adapt cultivation practices accordingly
- Get licence and contract from a buyer/processor



Want to learn how to grow hemp?

Industrial hemp eGuide www.hemptrade.ca.



Industrial hemp enterprise

[www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/agdex126](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex126)

InnoTech Alberta Field Day

Vegreville, July 20, 2017 (Thursday)



Thank you!

