


March 24, 2015 



Beyond Agronomy



My business

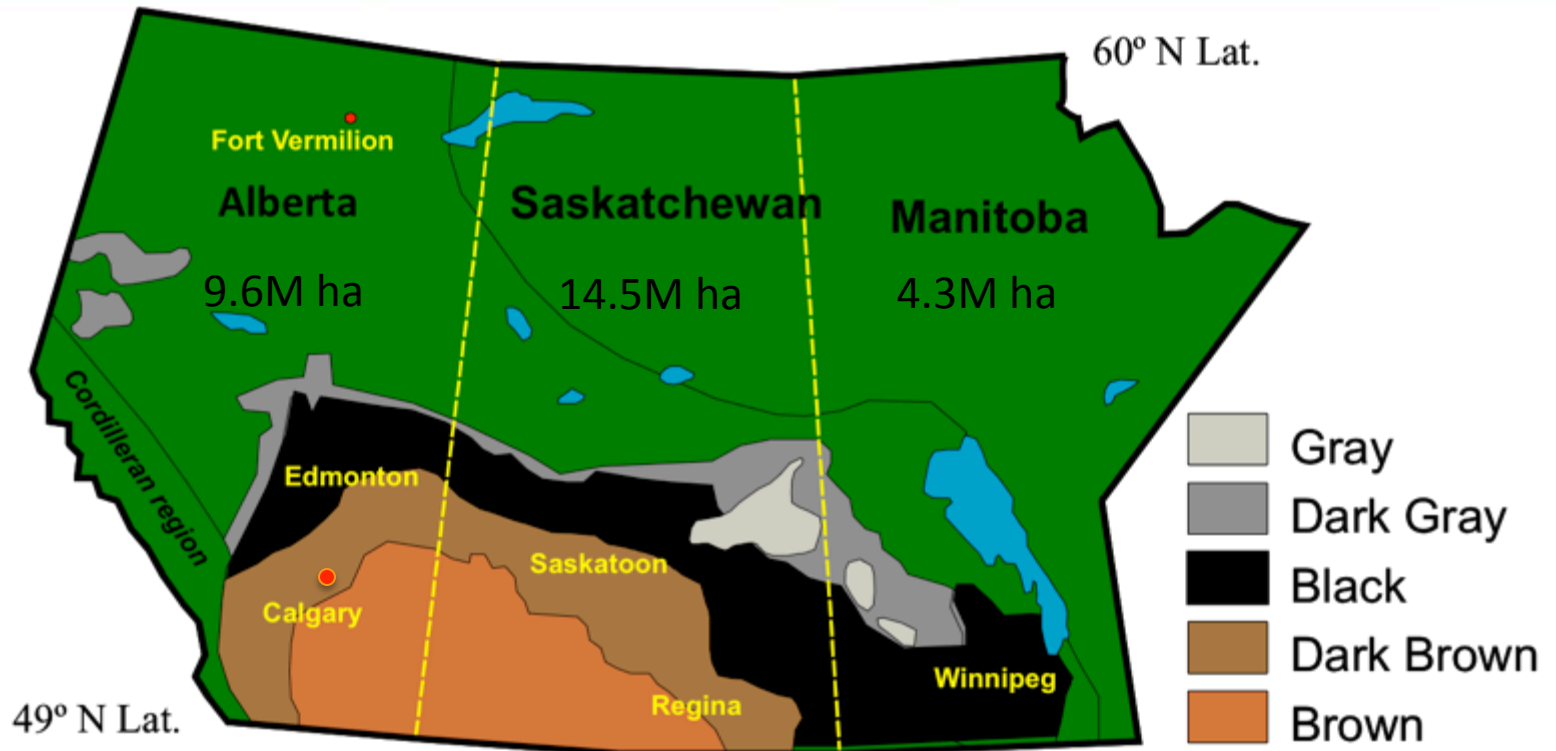


The farm

- 1st generation
- Farm with B-I-Law Mitch Currie
- 280 ha
- 65% clay soil
- Biggest field: 80 ha
- Smallest field: 4 ha
- No-till 9 years
- Controlled Traffic 6 years
- On-farm research

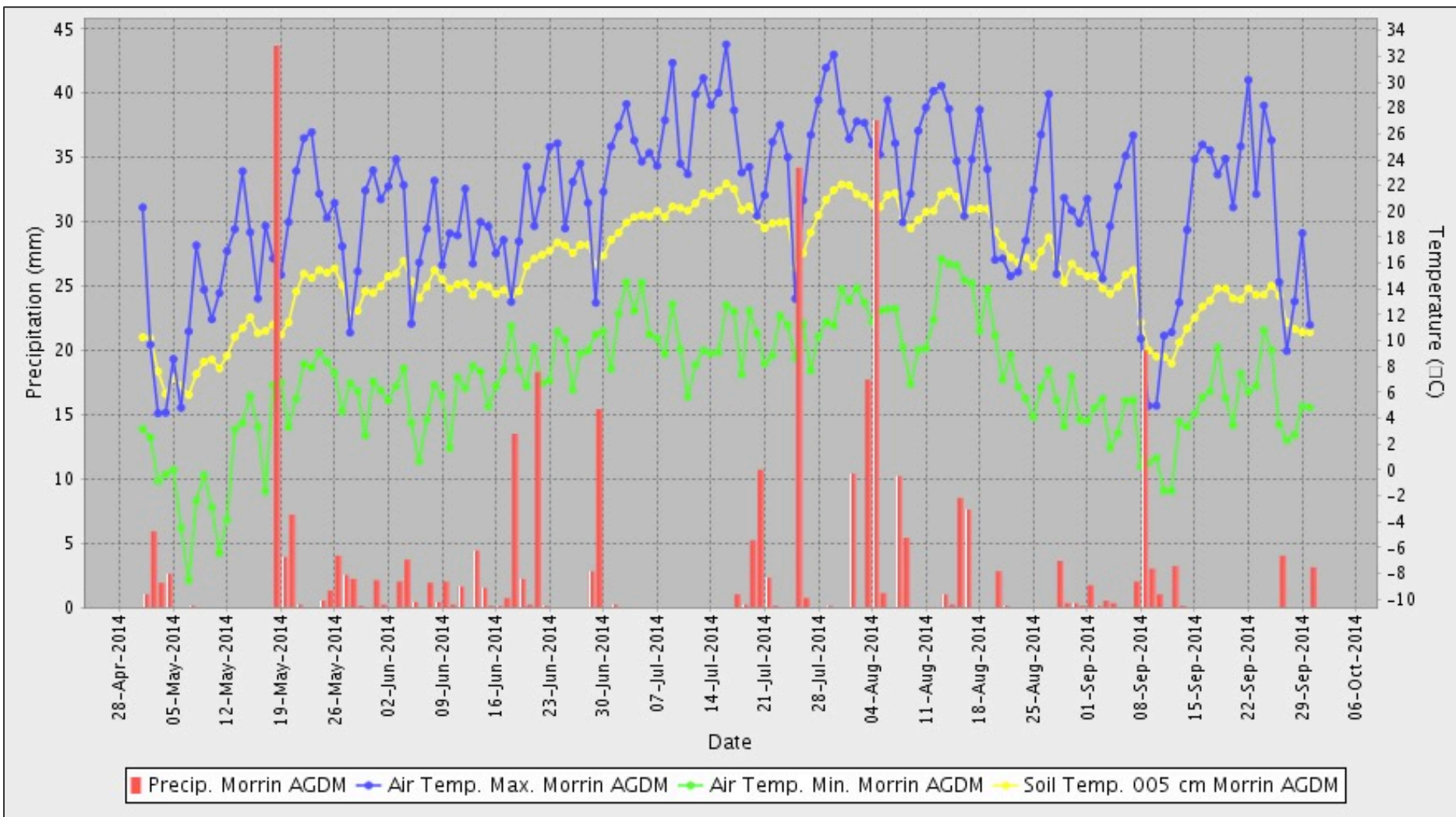


Climate on the Prairies



- 200 to 1200M elevation
- 250 to 350 mm annual precipitation
- Growing season – 90 to 120 days
- Spring wheat, canola, barley, peas, lentils

Farm climate data: 2014 (300 mm)



France



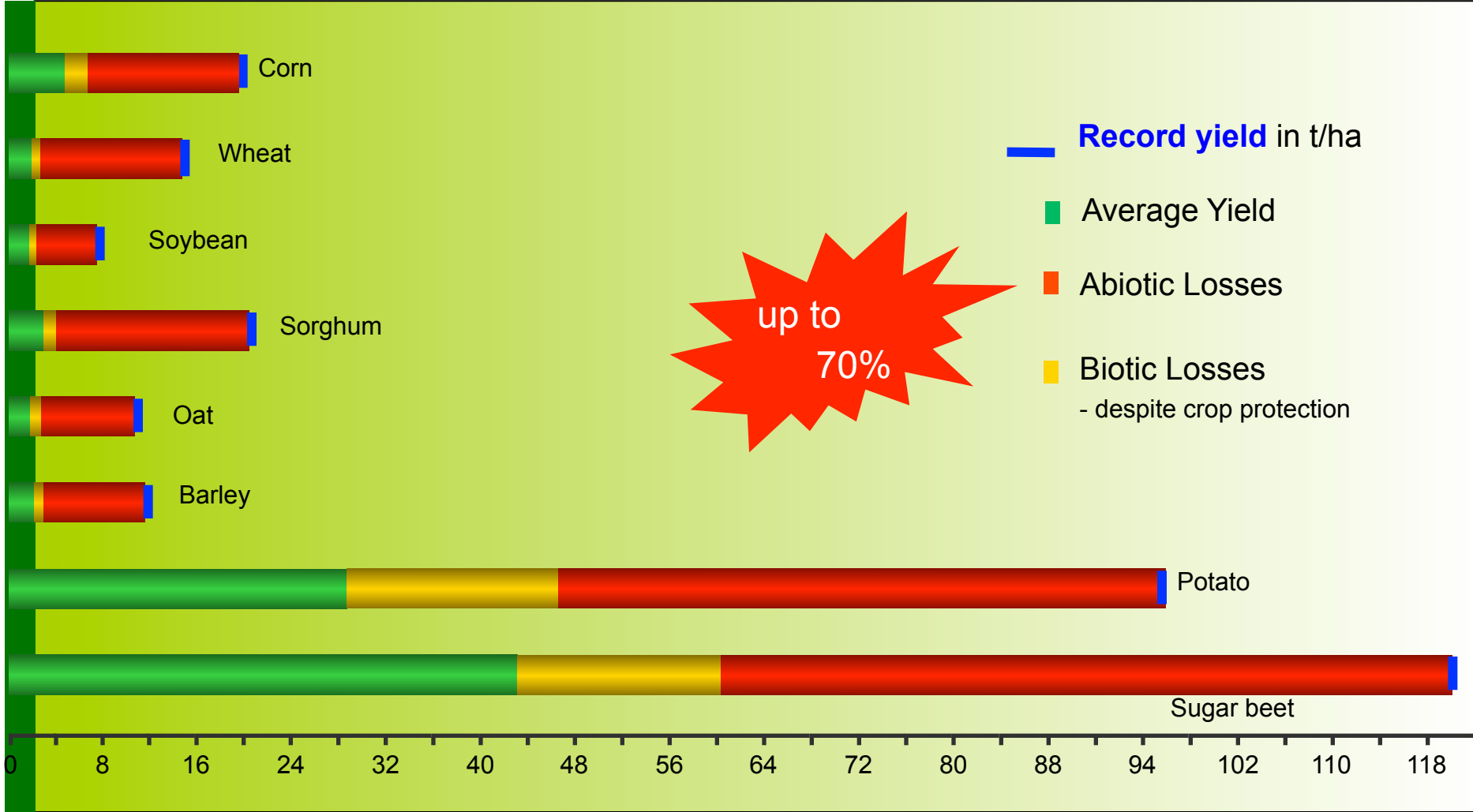
Land Mass: 640,000 km²
Population: 62 M
Arable: 21.4 M ha

Canada



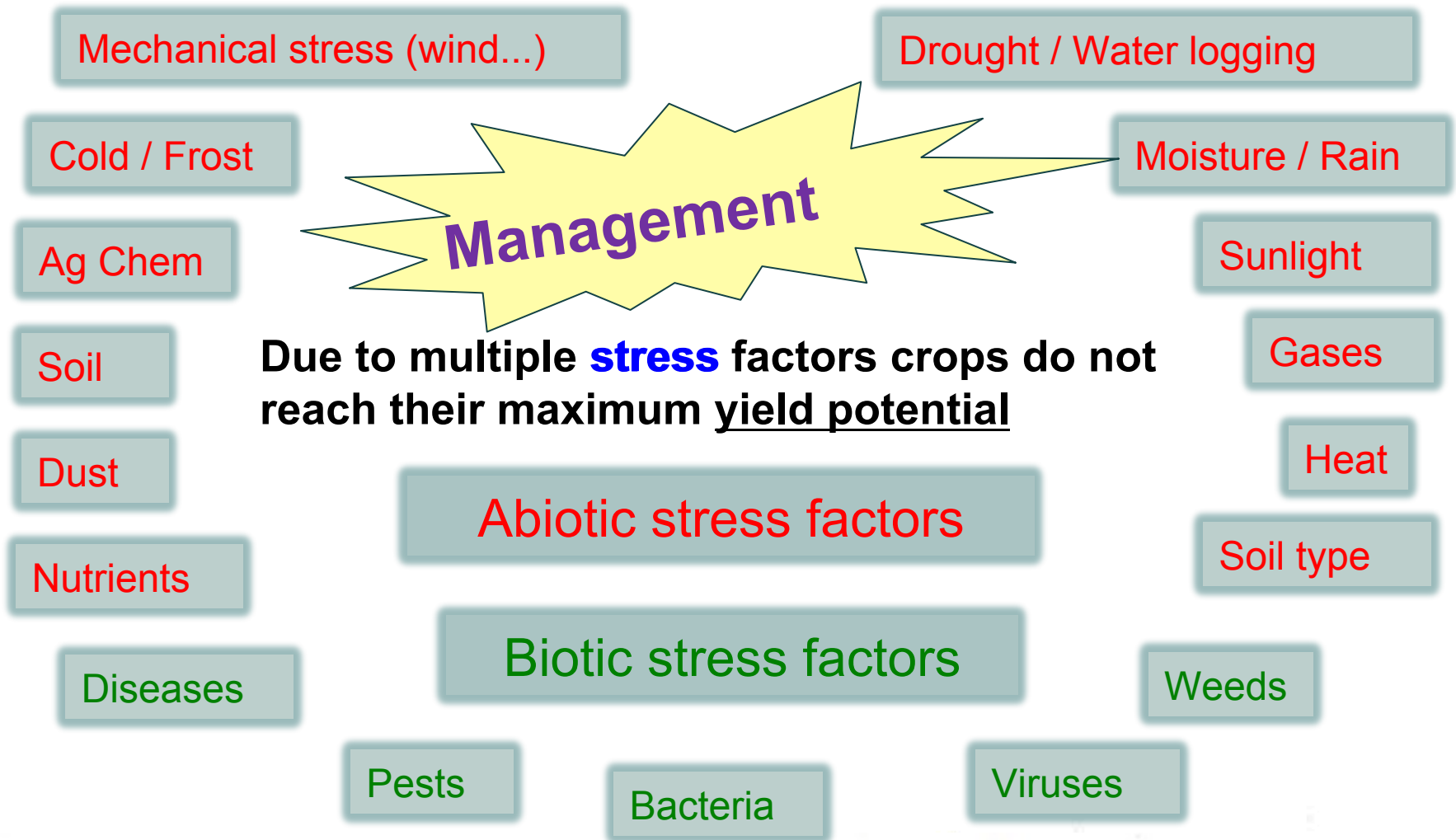
Land Mass: 9.9 M km²
Population: 35 M
Alberta: 660,000 km²
Alberta Pop: 4 M
Arable: 41.5 M ha

Climate variability and production



Source: Buchanan, Gruissem, Jones: Biochemistry and Molecular Biology of Plants American Society of Plant Physiologists, 2000

Abiotic vs Biotic Stress



Topics

- Controlled traffic farming
- Side dress nitrogen



Why controlled traffic farming



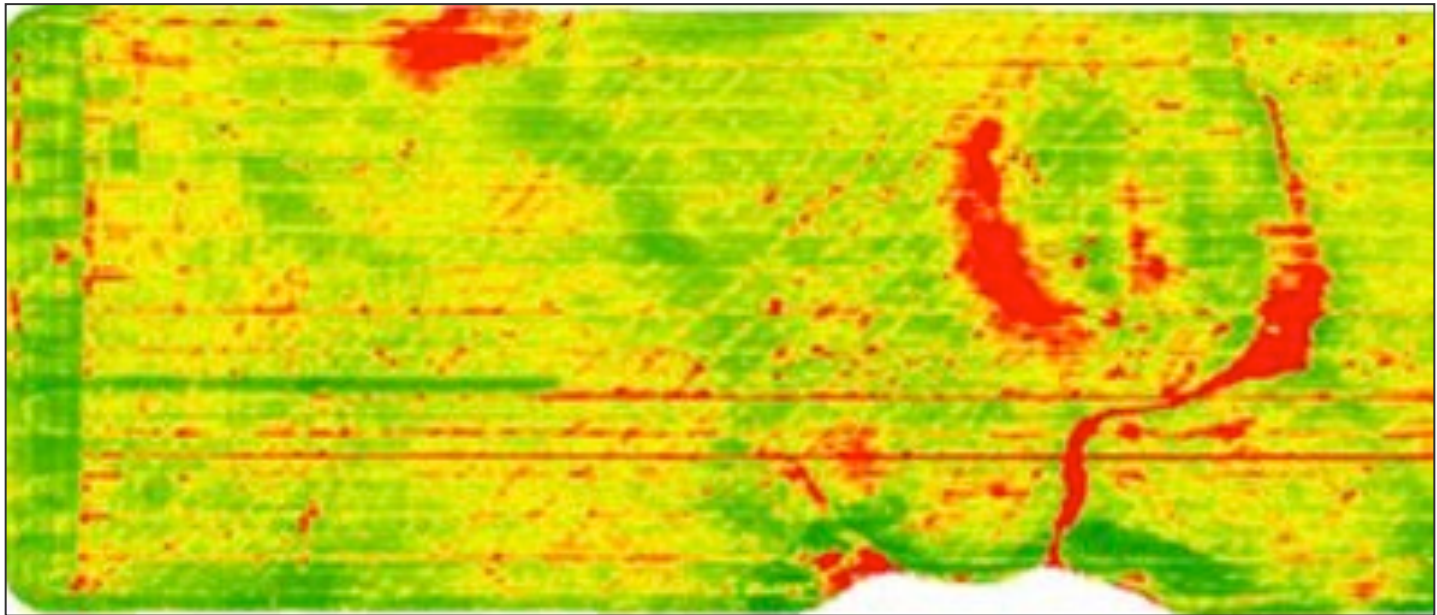
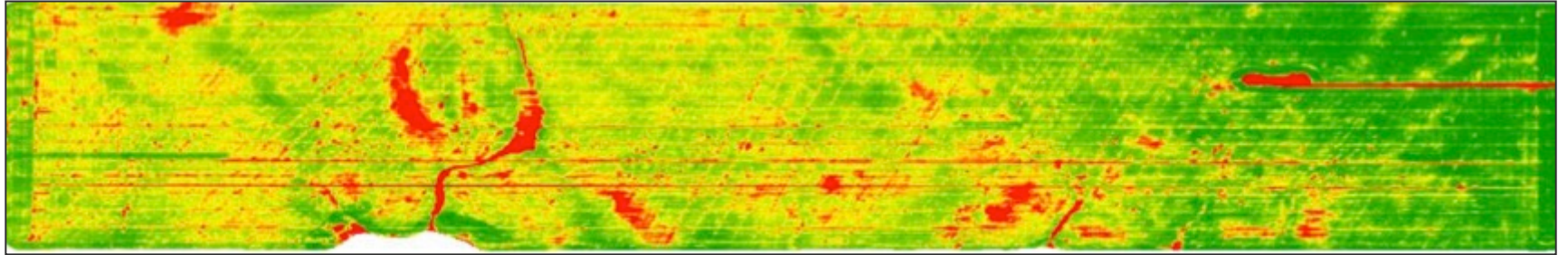
Compaction



Ble apres pomme de terre



Harvest traffic



Tramlines

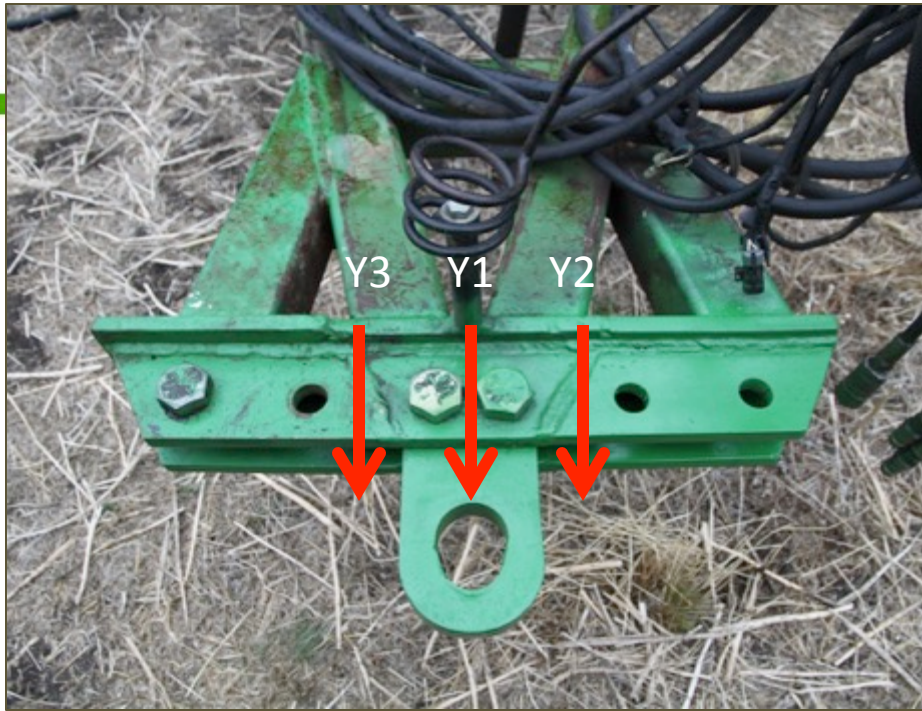


CTF Setup



Tractor 3M









Planting



Impacts of CTF



Soil structure



Bulk density g/cm³

Average Bulk Densities & Pore Space – Fall 2011						
		Check		CTF		
	Depth (inches)	Db	Pore %	Db	Pore %	
Sandy Loam	Site 1	0-6	1.36	48.51	1.27	52.07
		6-12	1.53	42.14	1.45	45.39
		12-24	1.50	43.35	1.48	44.16
		24-36	1.51	42.83	1.55	41.55
Sandy Loam	Site 2	0-6	1.33	49.80	1.12	57.89
		6-12	1.39	47.48	1.11	58.05
		12-24	1.38	47.80	1.20	54.71
		24-36	1.75	33.88	1.48	44.30
Clay Sodic	Site 3	0-6	1.12	57.66	1.08	59.24
		6-12	1.30	50.80	1.34	49.27
		12-24	1.28	51.78	1.34	49.42
		24-36	1.29	51.22	1.56	41.16
Clay	Site 4	0-6			0.84	68.20
		6-12			0.95	64.21
		12-24			1.05	60.43
		24-36			1.20	54.63

8%

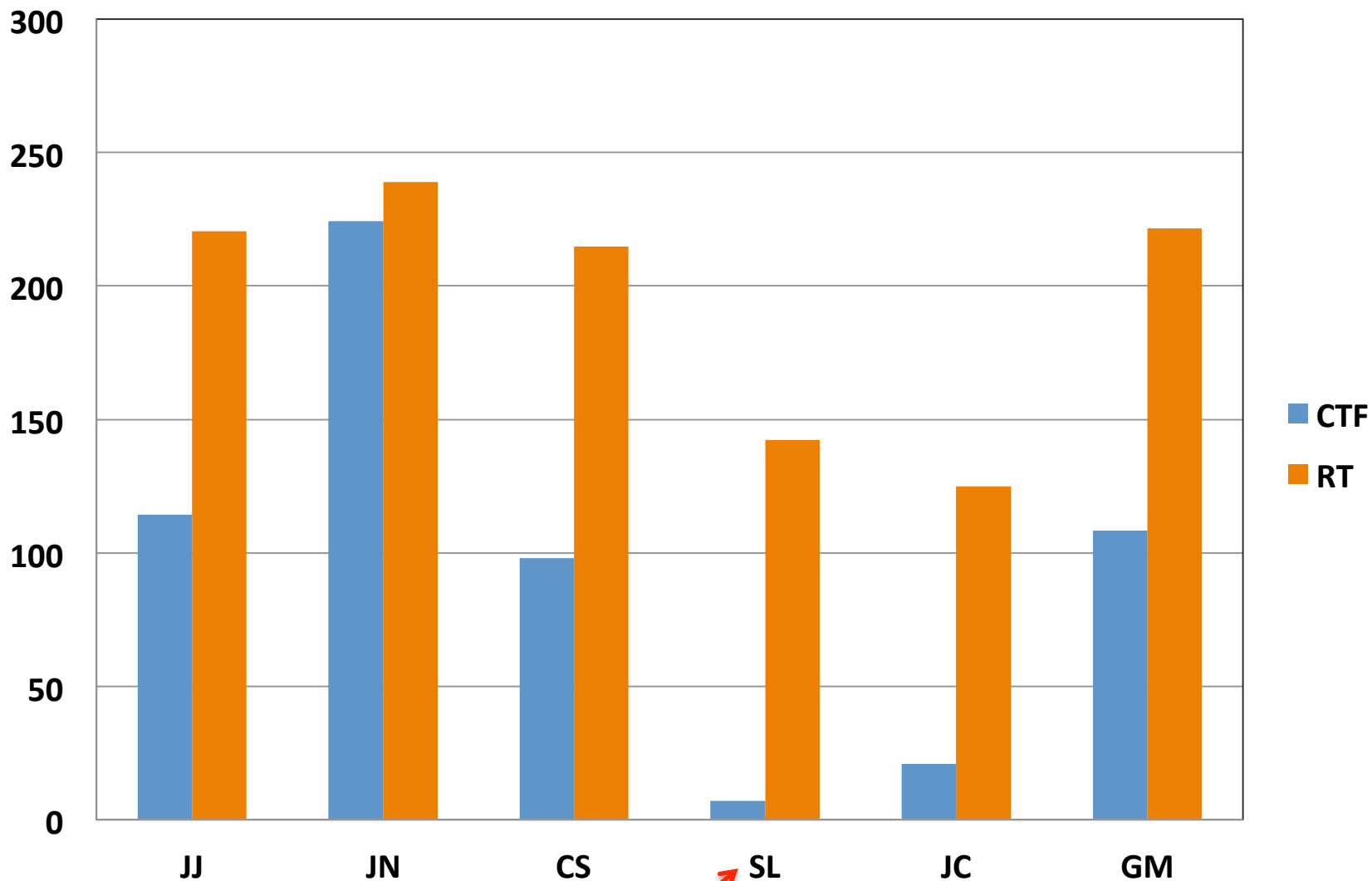
38%

0%

Me



Time to Infiltrate 25mm of Water (seconds)



Me

Bulk density – Castor wheel only



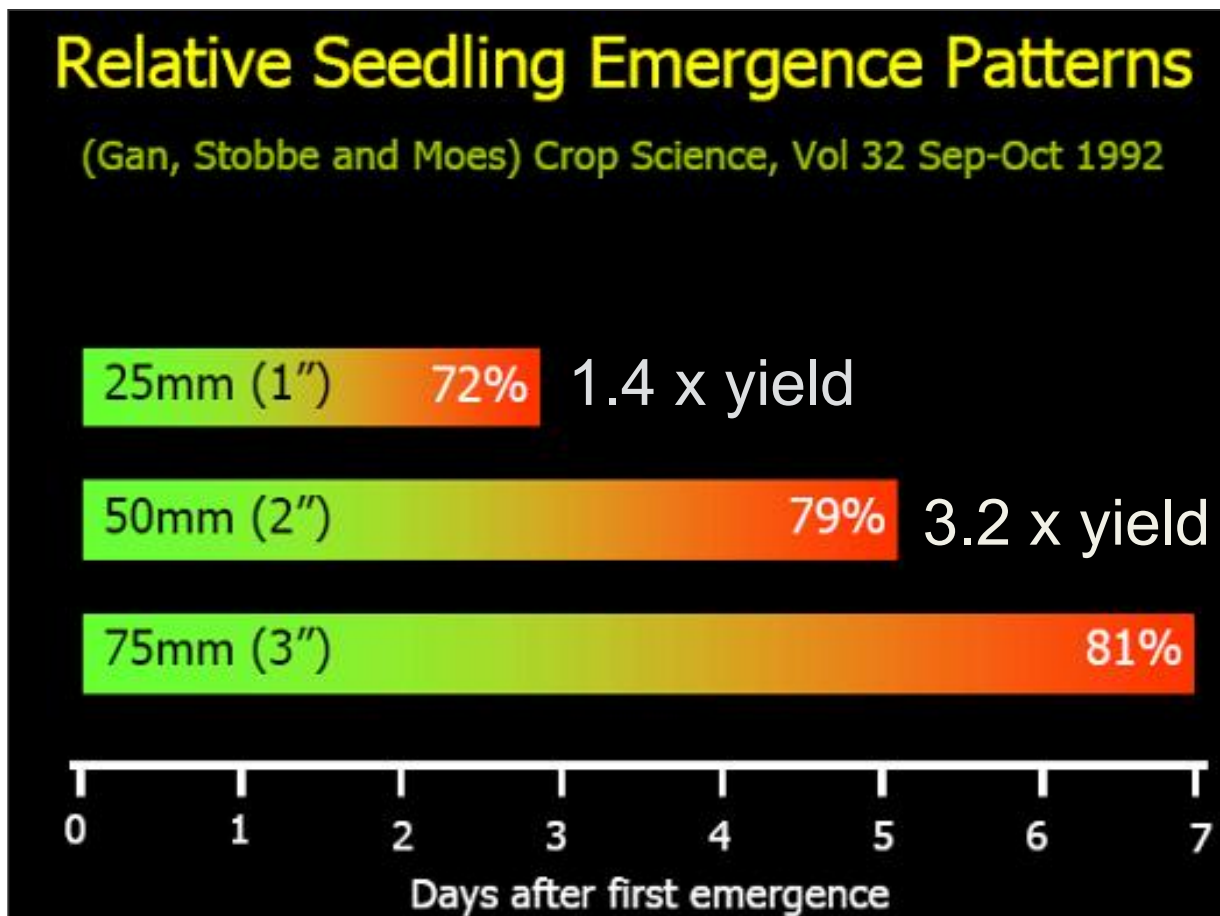
Soil resistance



Seed Placement

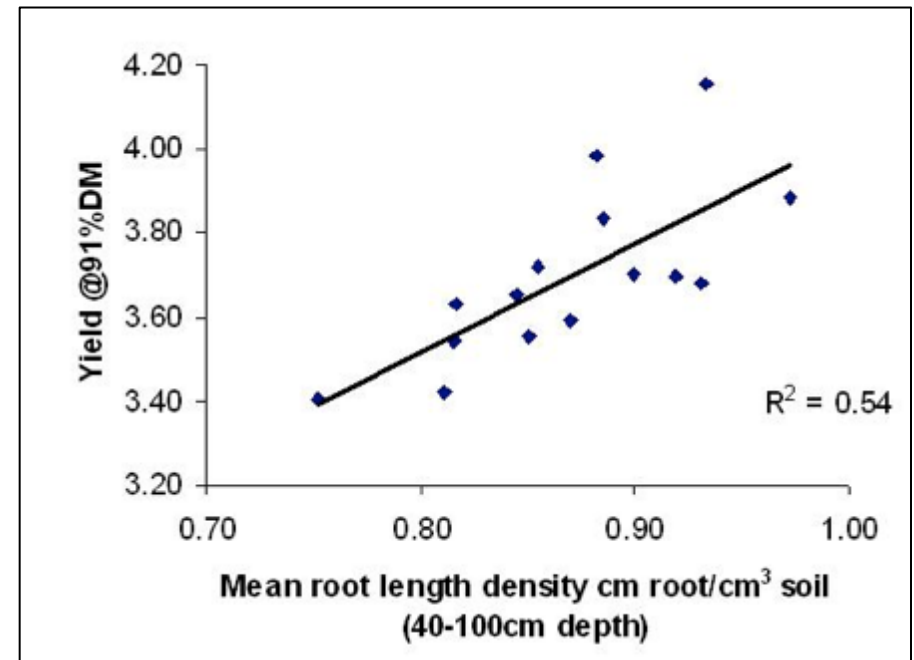


Seeding Depth



Gan, Stobbe and Moes et al 1992

Root Index



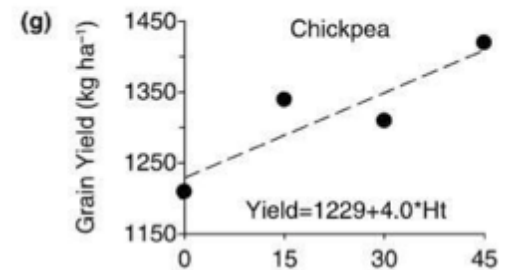
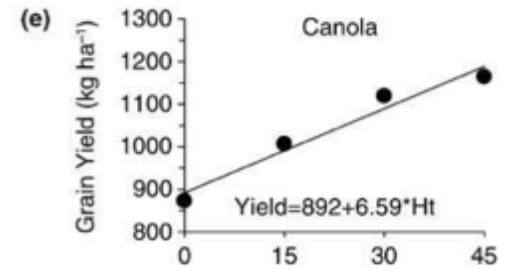
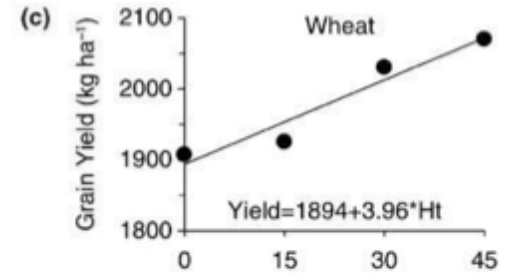
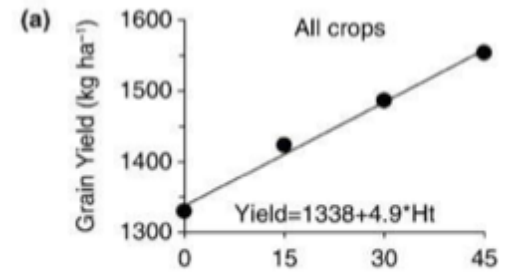
Source: ADAS Boxworth 2005



3.5 t/ha (125mm)



Residue Mgt

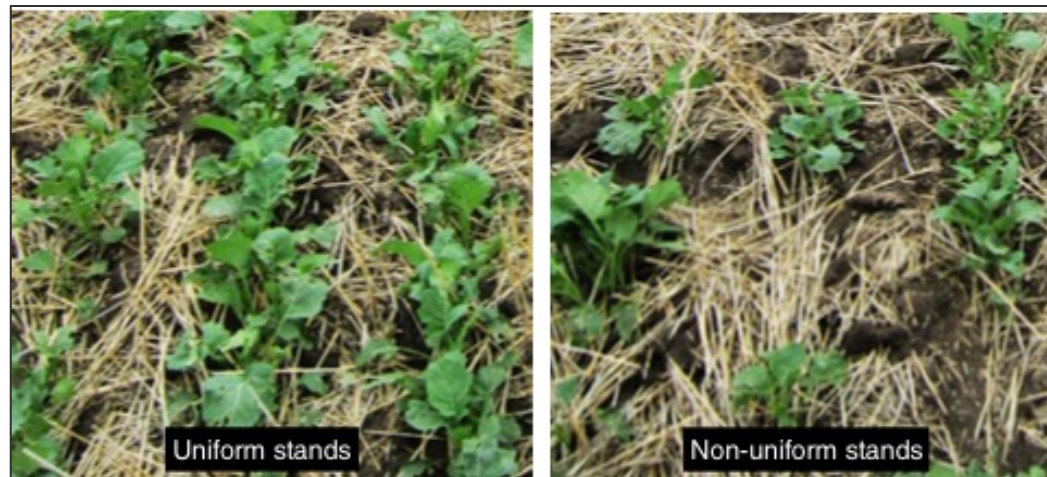


Source: Cutforth & McConkey et al 1997

Canola planted into 7 t/ha wheat



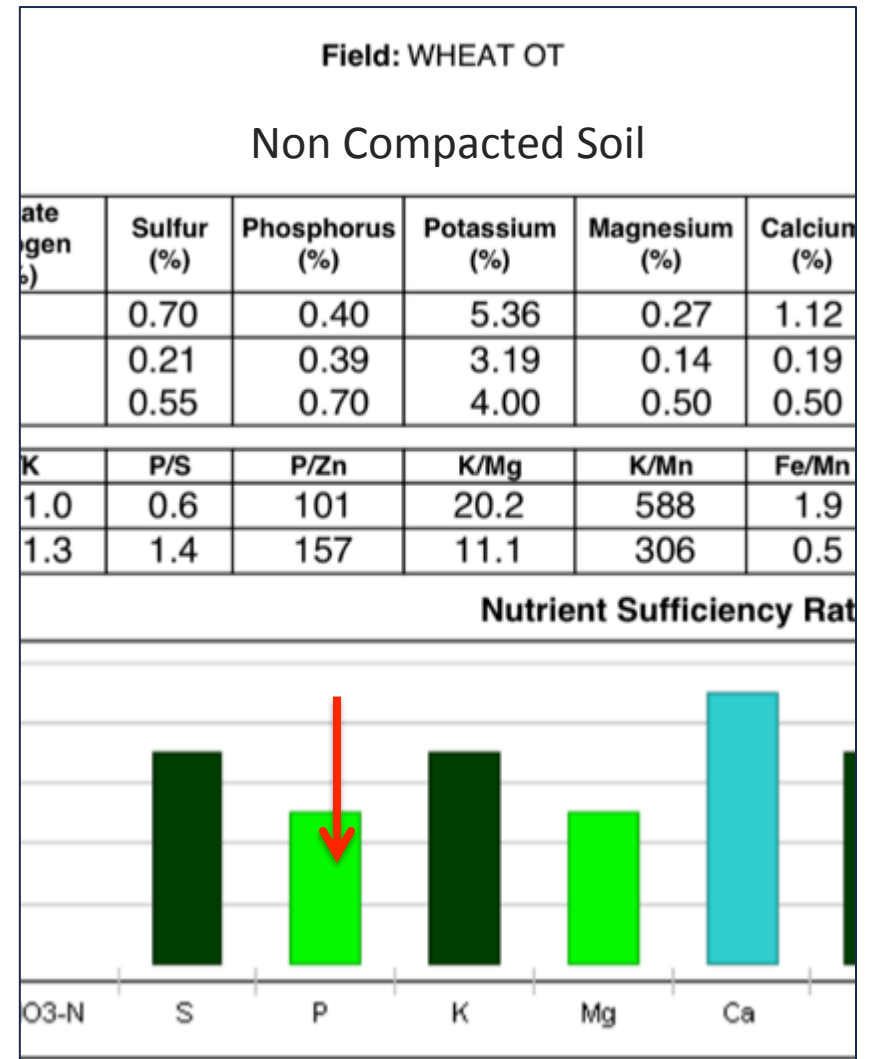
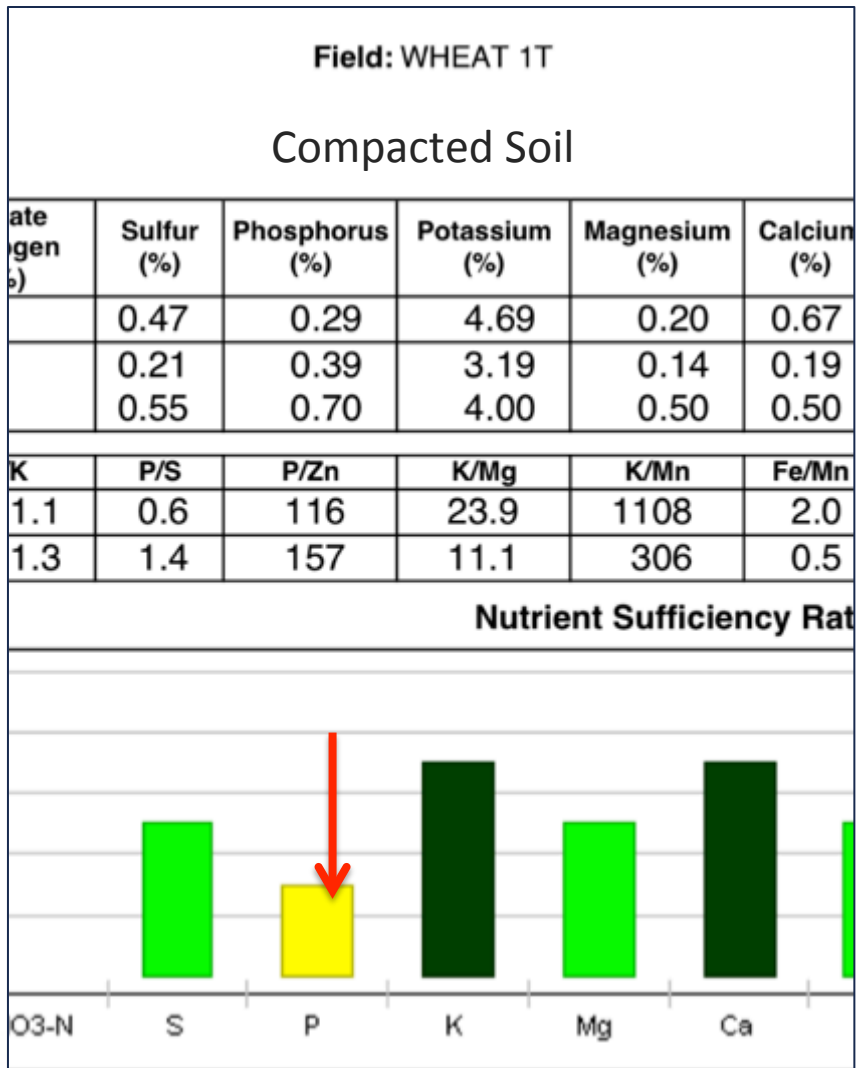
Spatial Patterns



Up to 32 % yield increase with optimized spatial patterns of canola plant establishment in western Canada

Agronomy for Sustainable Development, October 2014, Volume 34, Issue 4, pp 793-801

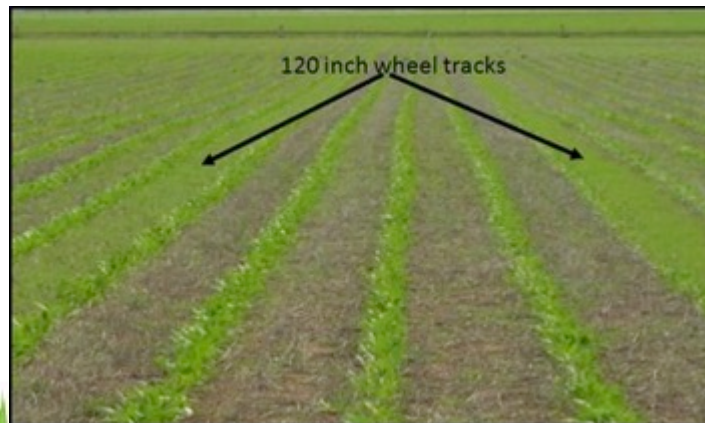
Nutrient Availability



Weed Control



Weed Control



Animals & CTF



Harvest Efficiency

6 " stubble height: 40 T/hr

vs

16" stubble height: 60 T/hr

Increase = \$4,800 more harvested/hr



Harvest Efficiency





Timeliness



Timeliness



Benefits of Controlled Traffic

- Manage climate variability (abiotic stress)
- Improved timeliness
- Improved infiltration and soil bulk density
- Fuel efficiency 10%
- Increased nutrient uptake: P+K 15-20%
- Accurate yield data
- Profit??



Resources

CTF Europe

<http://www.controlledtrafficfarming.com/Home/Default.aspx>

Tim Chamen

Hans Henrick Pedersen

CTF Alberta

<http://controlledtrafficfarming.org/>

Peter Gamache



Side dress nitrogen



Side dress nitrogen: Canola (150 mm)

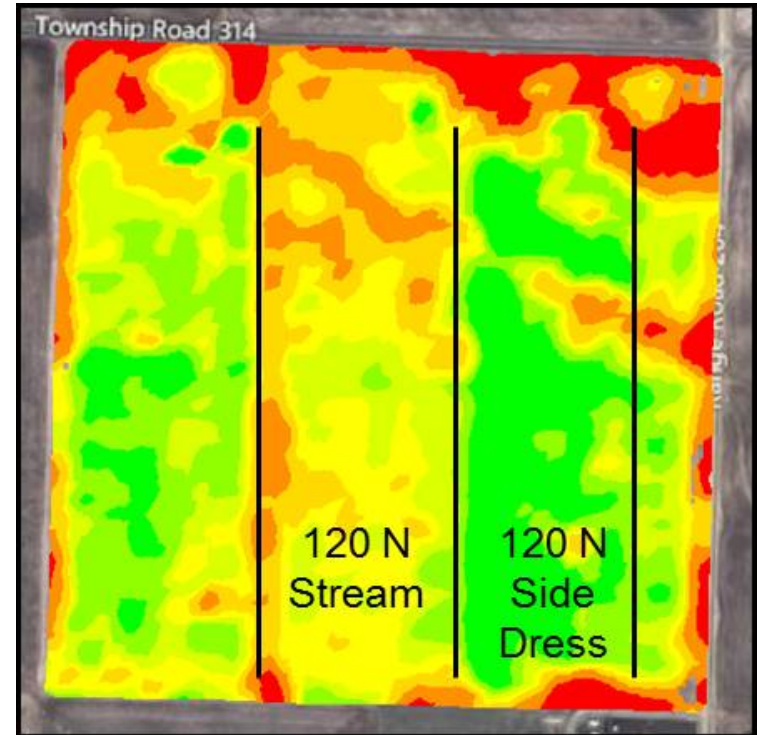
55 kg/N at planting,

105 kg/N side dressed = 3.7 t/ha

105 kg/N streamed = 3.2 t/ha

Yield increase

13.5% or \$185.00 ha



Side dress nitrogen: Wheat

Trial 1: 15kg/N split 55 kg/N side = 5.7 t/ha

Trial 2: 80 kg/N planting = 6.78 t/ha

Trial 3: 80 kg/N split 55 kg/N = 8.34 t/ha

Yield Increase = 23%

Profit: \$225 ha

Trial 4: 90 kg/N split 55N = 10.5% vs 12.3%
protein



Merci!!

More info at www.beyondagronomy.com

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