



CTF – Weed Resistance Update

K. Neil Harker
AAFC Lacombe RDC

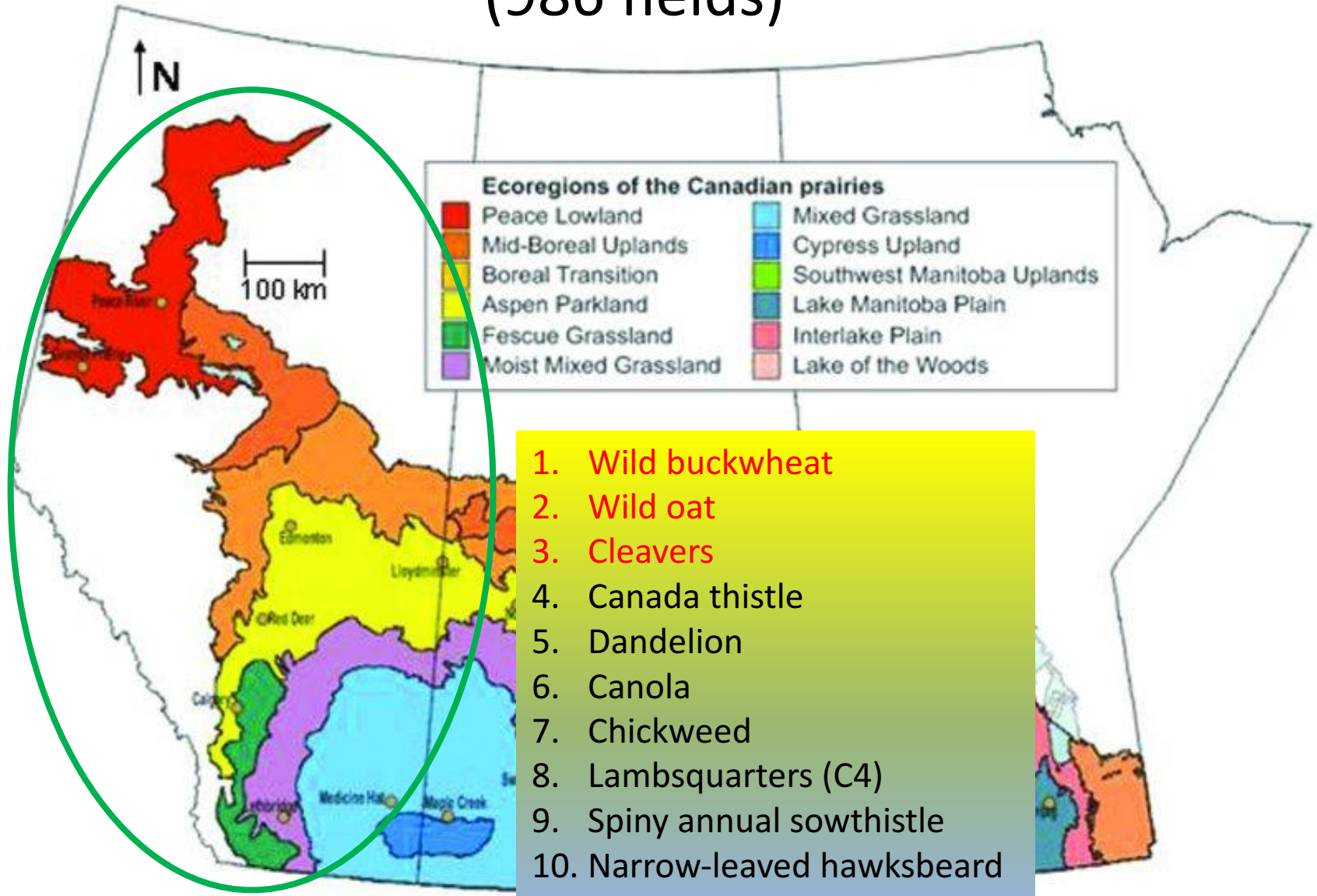
CTF Meeting
Dec 16, 2016
Lacombe, AB



2010 Alberta Weed Survey - Dryland Crops

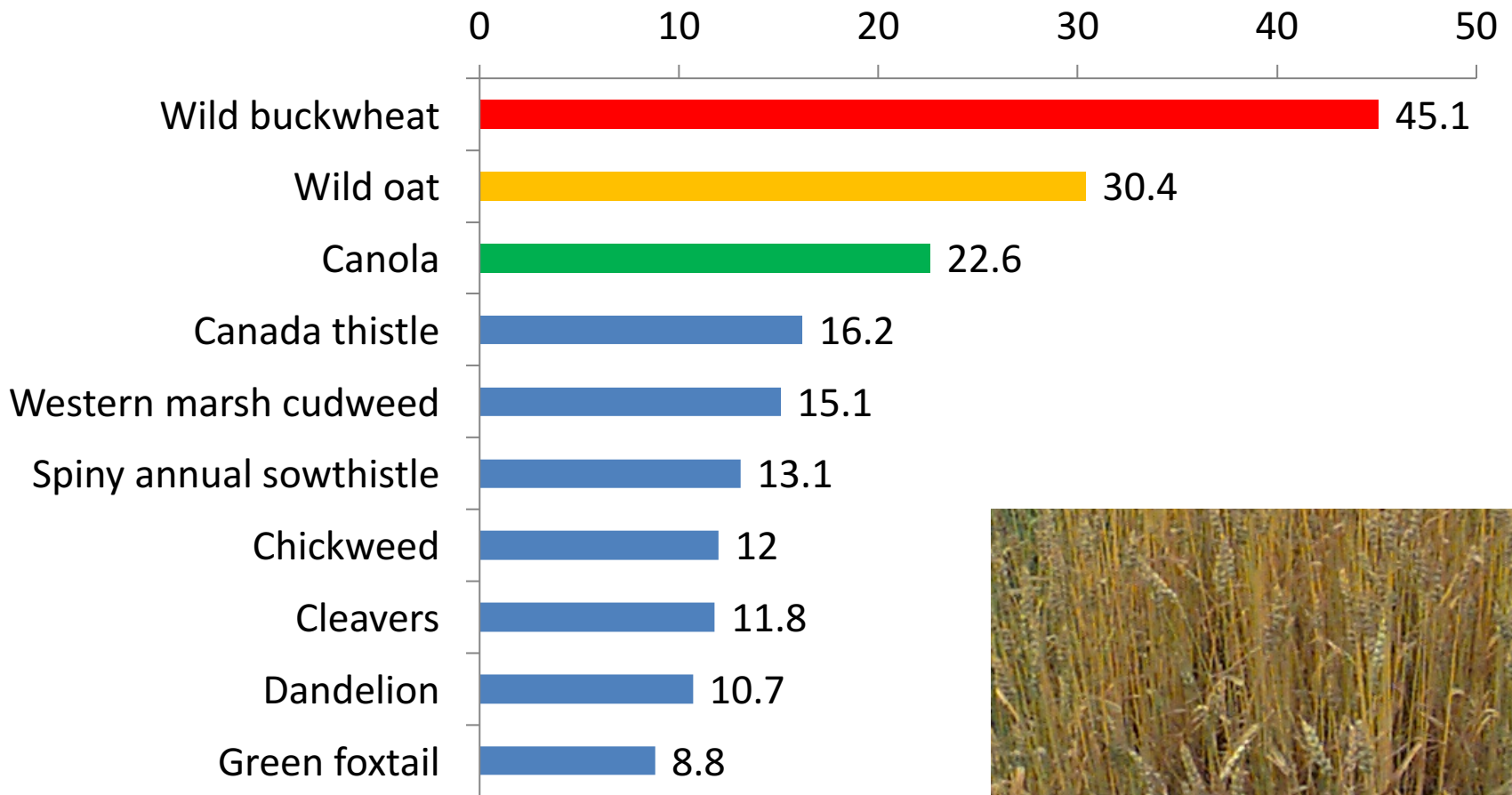
J. Leeson, C. Neeser N. Kimmel and M. Vadnais
Weed Survey Series – Pub. 12-1 (2012)

Alberta – RA Rank (986 fields)



Top 10 Weeds – Spring Wheat

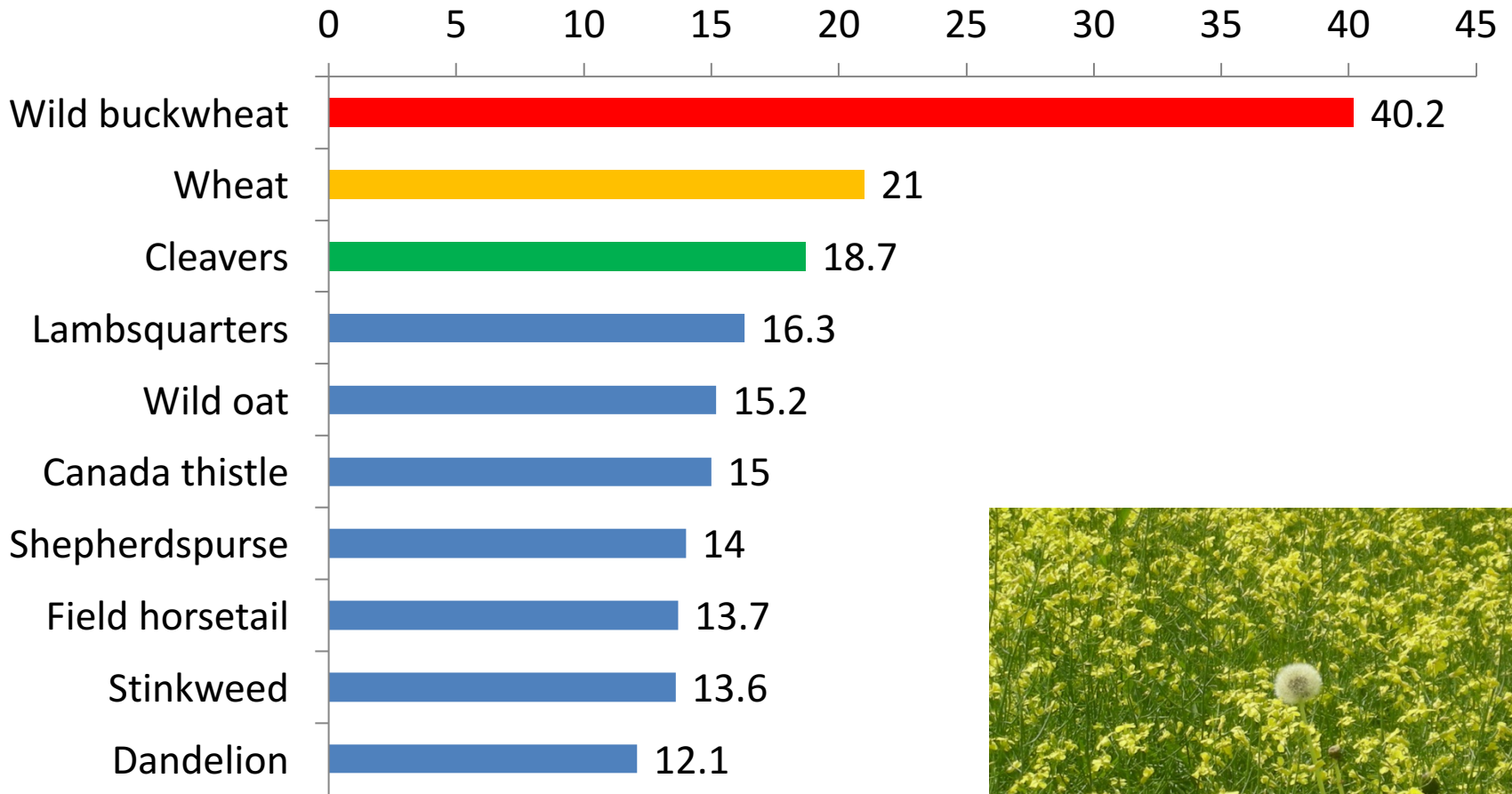
- Relative Abundance (336 fields)



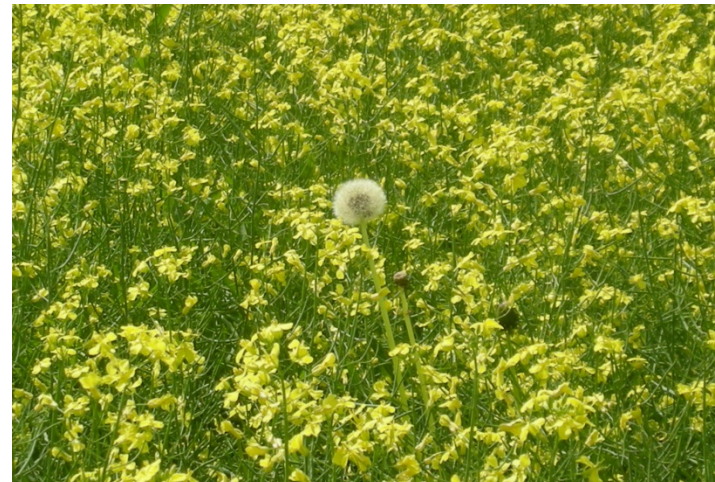
Post Management Surveys (after herbicides)

Top 10 Weeds – Canola

- Relative Abundance (252 fields)

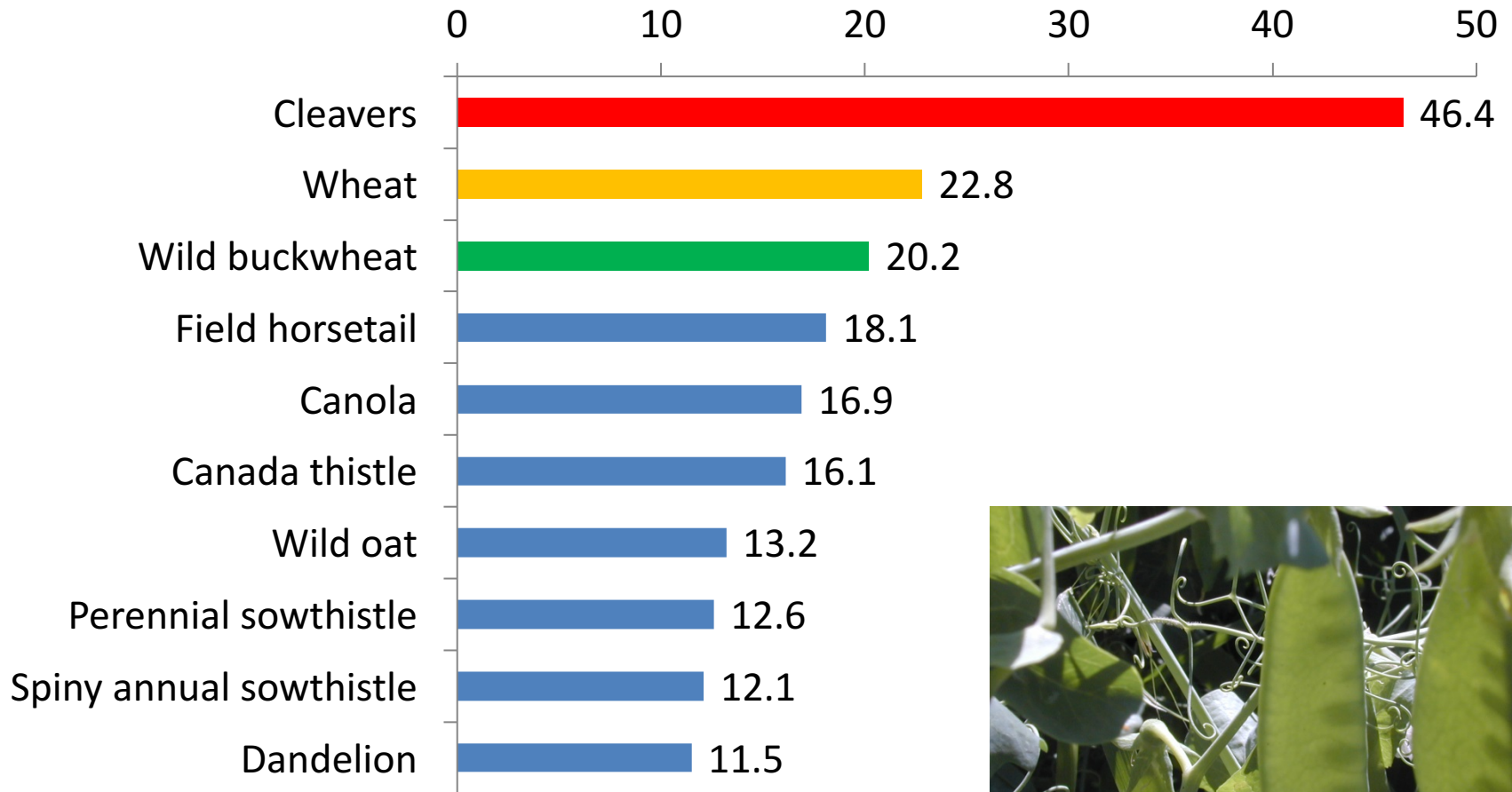


Post Management Surveys (after herbicides)



Top 10 Weeds – Field Peas

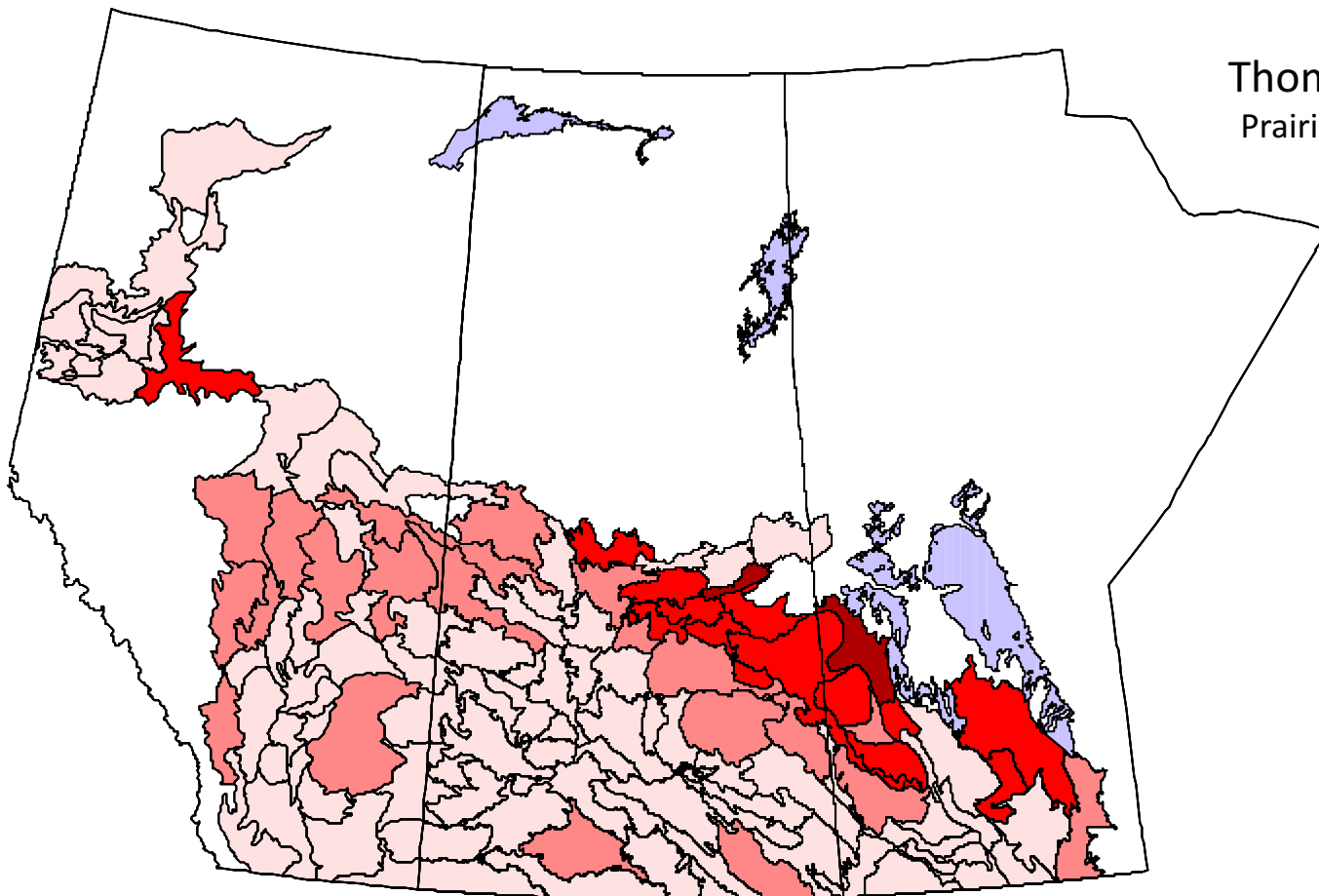
- Relative Abundance (65 fields)



Post Management Surveys (after herbicides)

Cleavers 1970s

Thomas & Leeson
Prairie Weed Surveys



Frequency

Not included

0.1 to 4.9%

15.0 to 49.9%

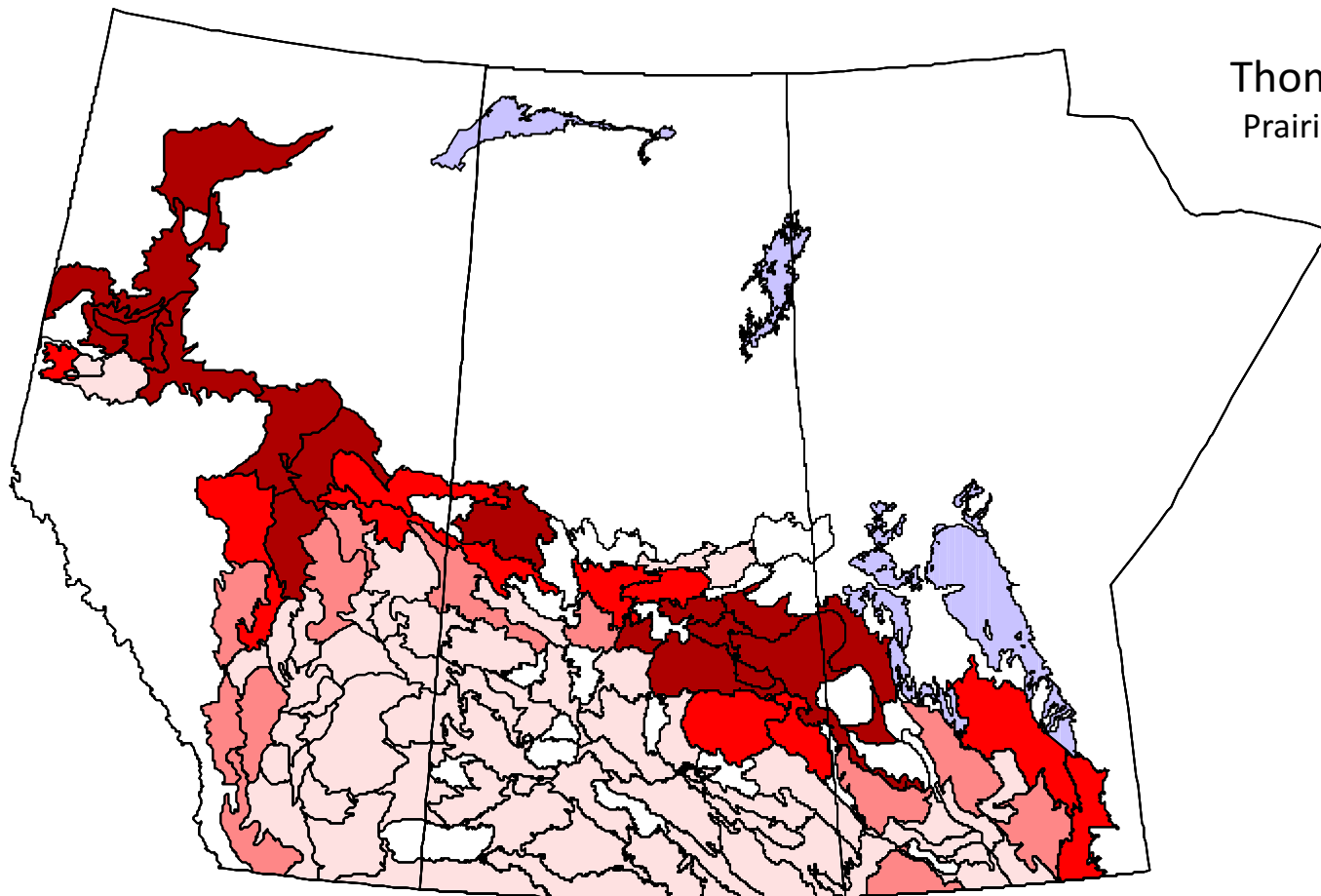
Absent

5.0 to 14.9%

More than 50.0%

Cleavers 1980s

Thomas & Leeson
Prairie Weed Surveys



Frequency

Not included

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0.1 to 4.9%

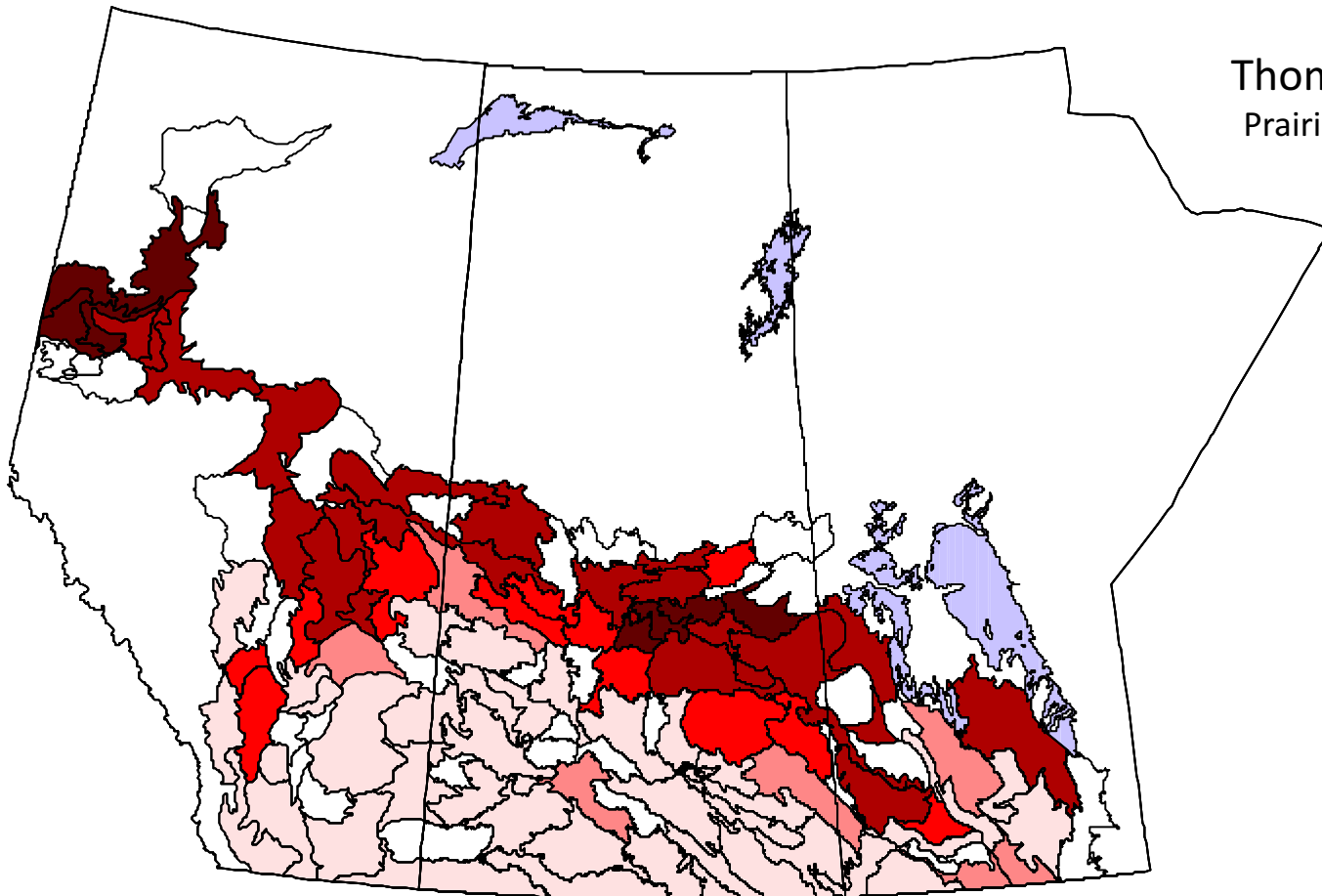
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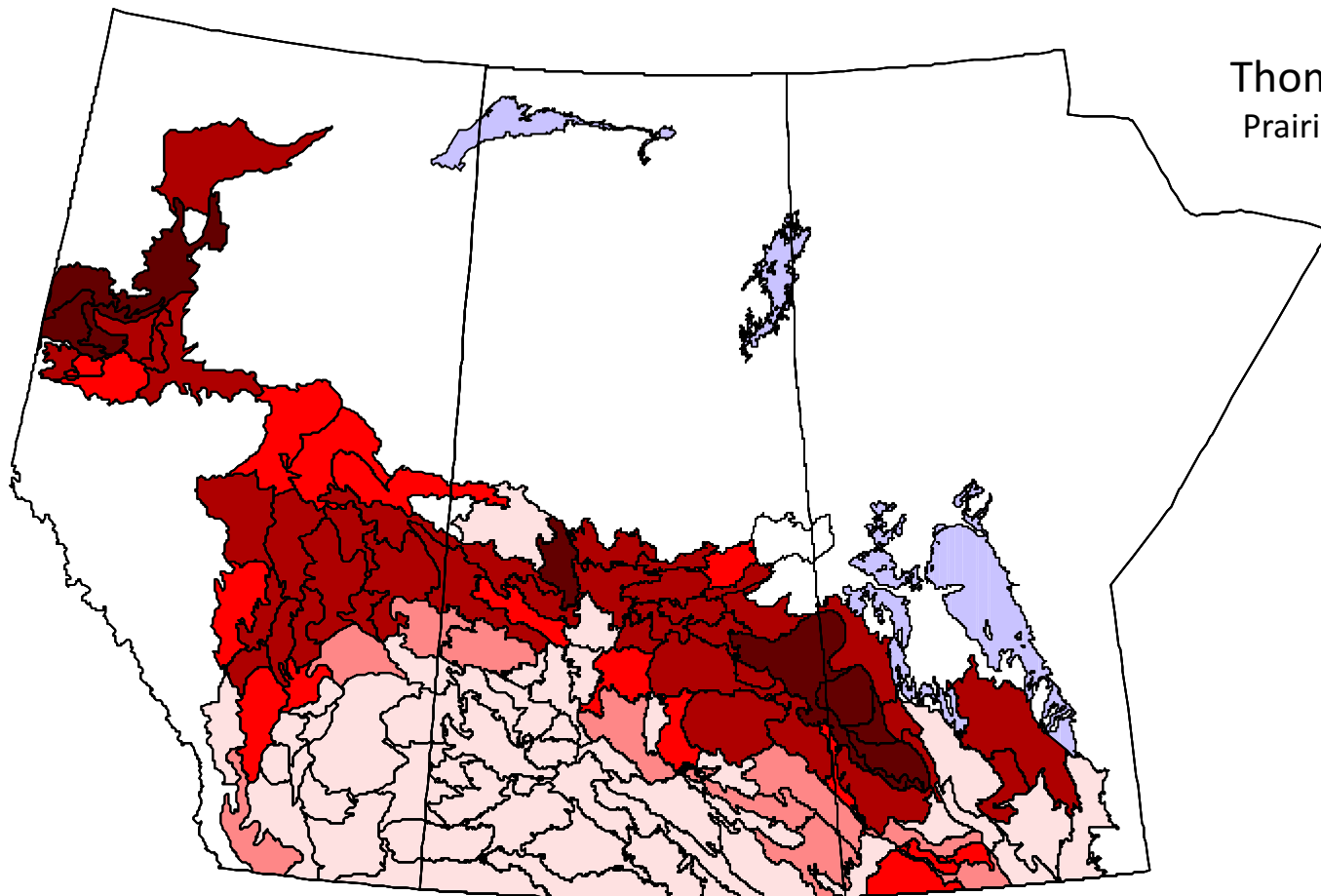
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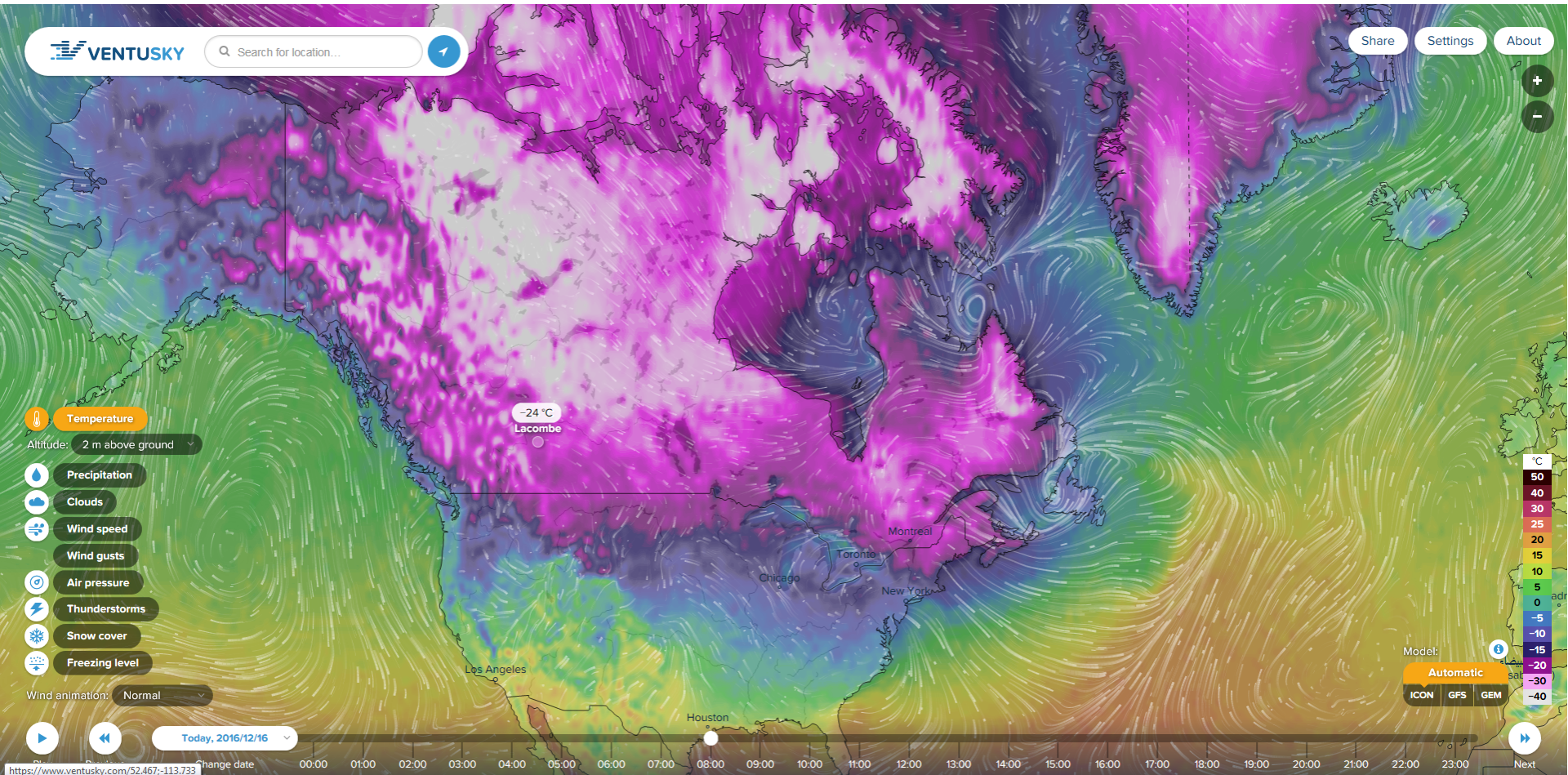
More than 50.0%

Herbicide Resistance...

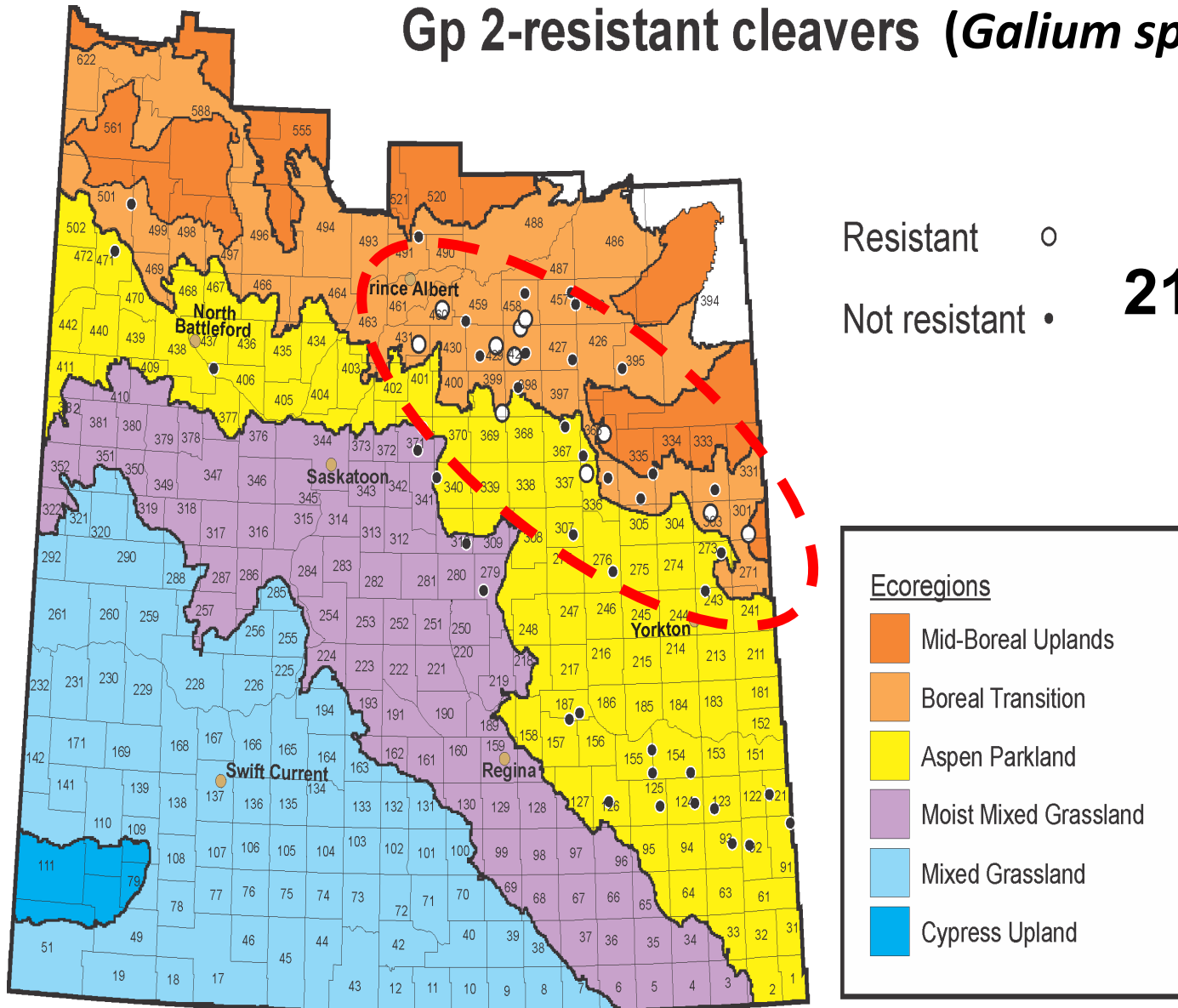


Great White North

- December 16, 2016



Gp 2-resistant cleavers (*Galium spurium*)



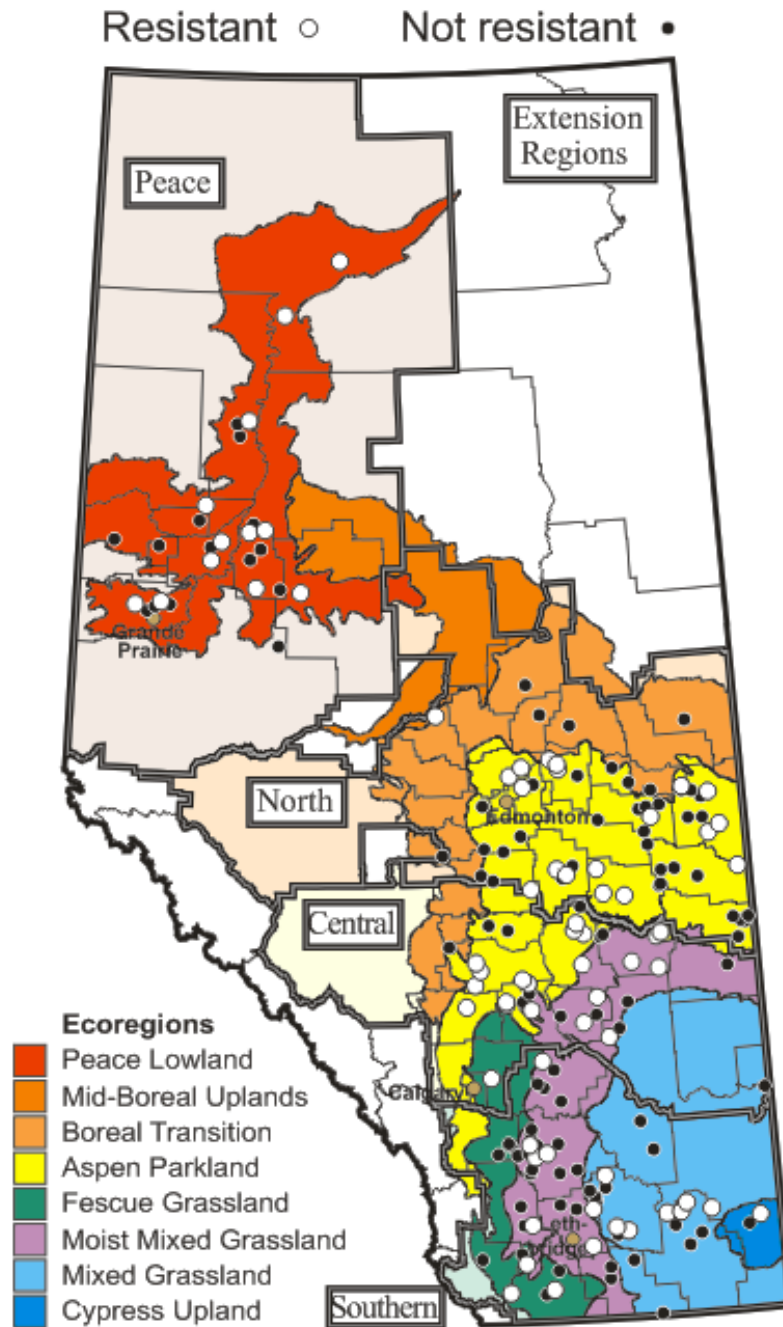
Resistant ○
Not resistant ●

**2009 SK:
21% of fields
surveyed**

Ecoregions

- Mid-Boreal Uplands
- Boreal Transition
- Aspen Parkland
- Moist Mixed Grassland
- Mixed Grassland
- Cypress Upland

Group 1 (A) (ACCase) Resistant *Wild Oat* Alberta



2001: 11% of fields



2007: 39% of fields



2014: > 50%

Provincial Resistance Maps
By Hugh Beckie

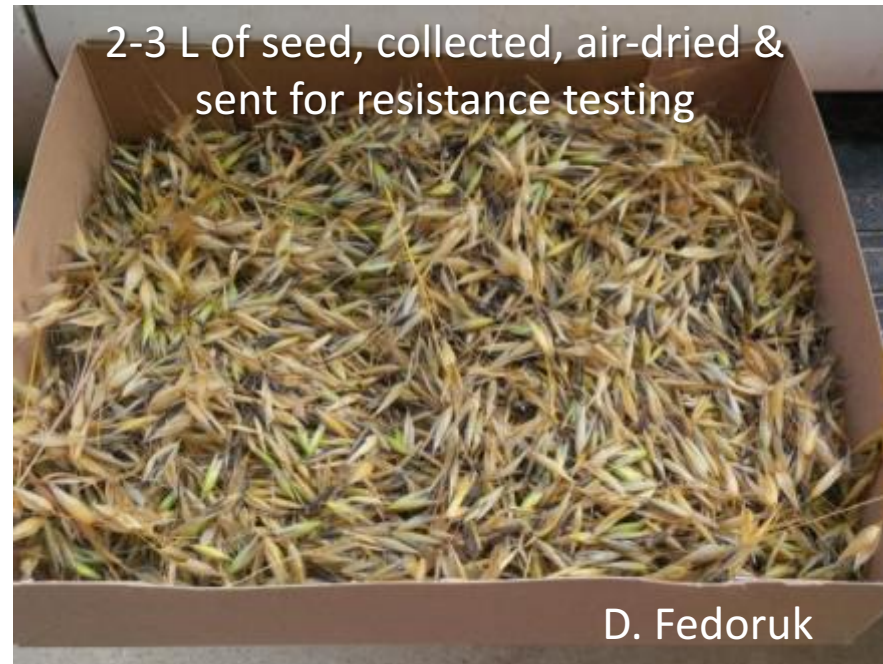
Post Management Patches – 3 Fields

- Central AB, Black Soil Zone



B. Tidemann

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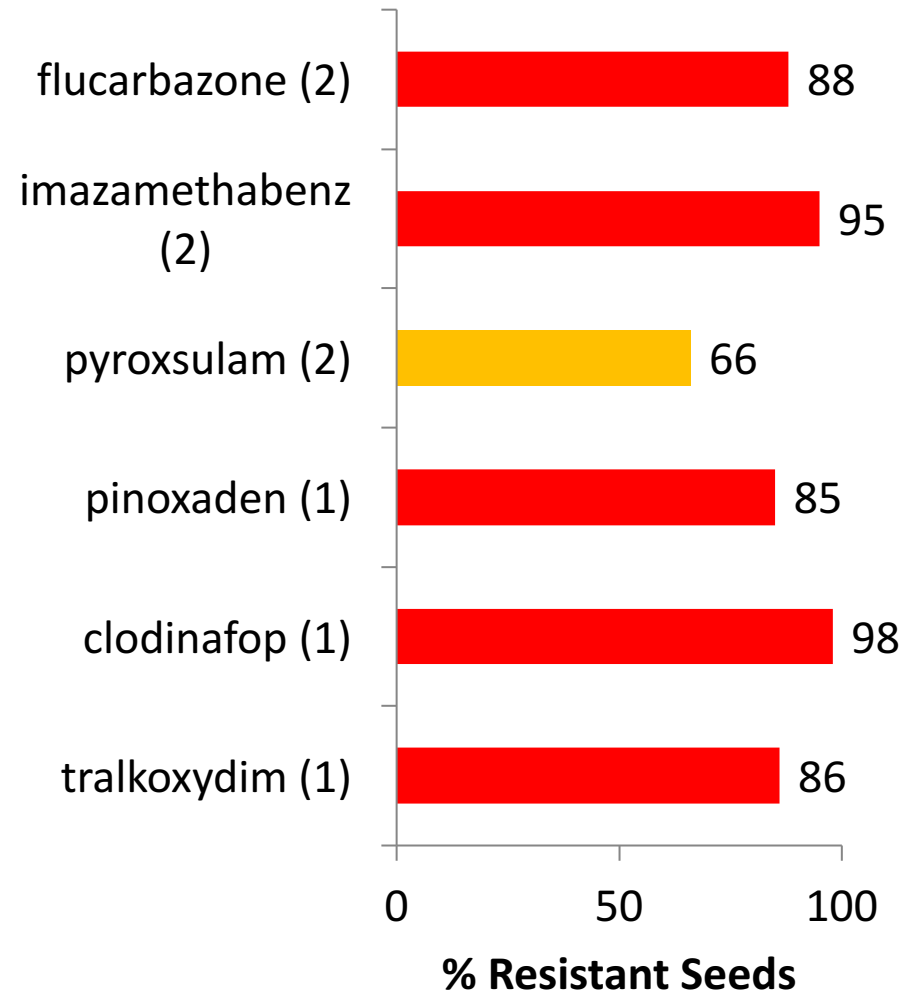


2-3 L of seed, collected, air-dried &
sent for resistance testing

D. Fedoruk

Patches from Field 3 (Fall 2014)

Year	Crop	WO Herbicides
2004	Wheat	clodinafop
2005	Wheat	fenoxaprop
2006	LL Canola	glufosinate/clethodim + clethodim
2007	Barley	pinoxaden + tralkoxydim
2008	Barley	imazamethabenz
2009	RR Canola	glyphosate + glyphosate
2010	Wheat	triallate/trifluralin + clodinafop
2011	Peas	ethalfluralin + quizalofop
2012	Wheat	pyroxsulam
2013	LL Canola	Glufosinate/clethodim
2014	Wheat	pyroxsulam + pinoxaden



Multiple Resistant Wild Oat

- Manitoba, 2015, in Spring Wheat

fenoxaprop-P-ethyl,
imazamethabenz-methyl,
imazapyr, pyroxasulfone,
quizalofop-P-ethyl,
sulfentrazone, and triallate

Multiple Resistance: 5 Sites of Action

ACCase inhibitors (A/1)

ALS inhibitors (B/2)

PPO inhibitors (E/14)

Long chain fatty acid inhibitors (K3/15)

Lipid Inhibitors (N/8)

Heap 2016

<http://weedscience.org/Summary/Species.aspx>

Reduction in Conservation Tillage

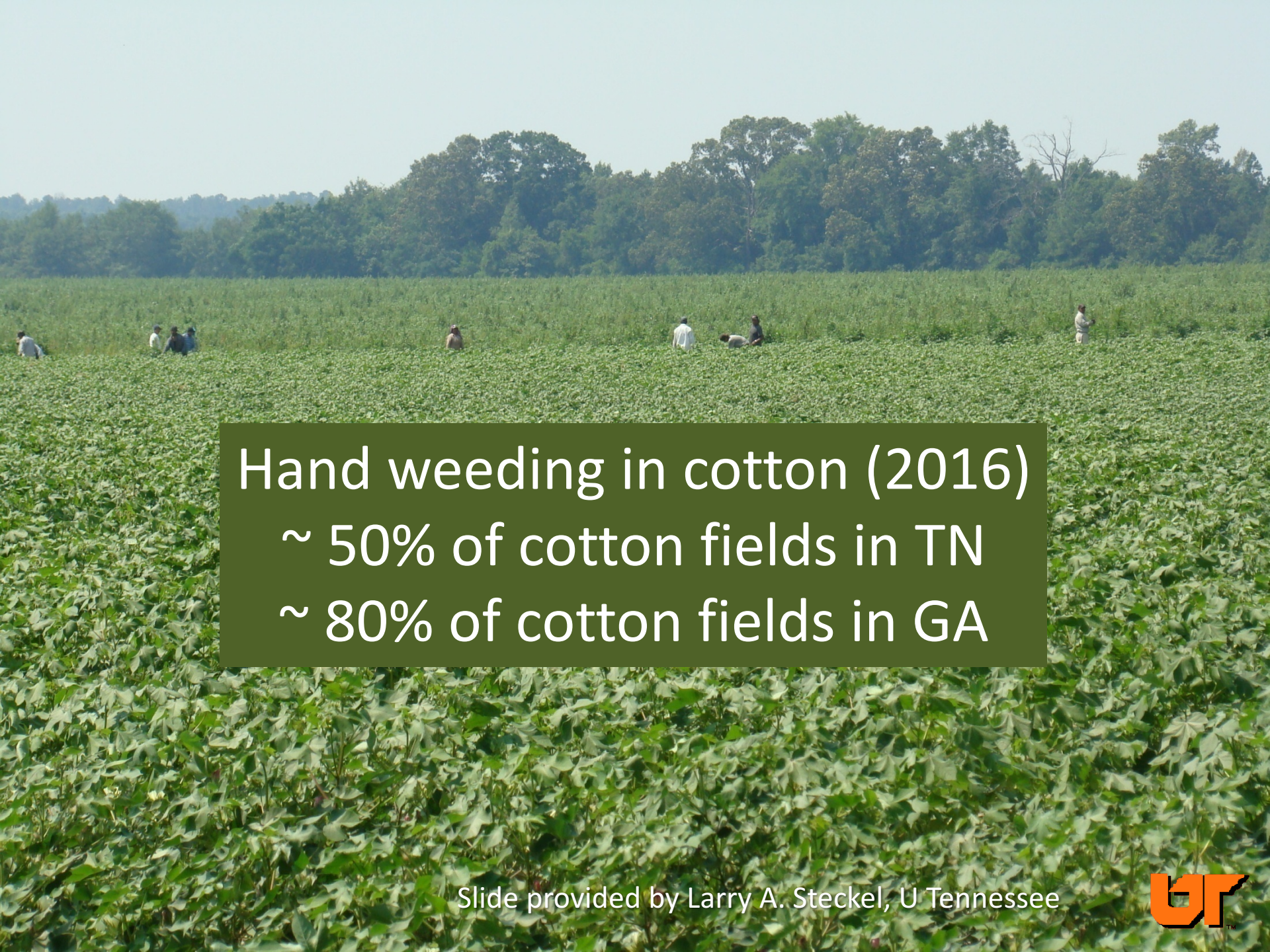


Slide provided by Larry A. Steckel, U Tennessee



Hand Weeding



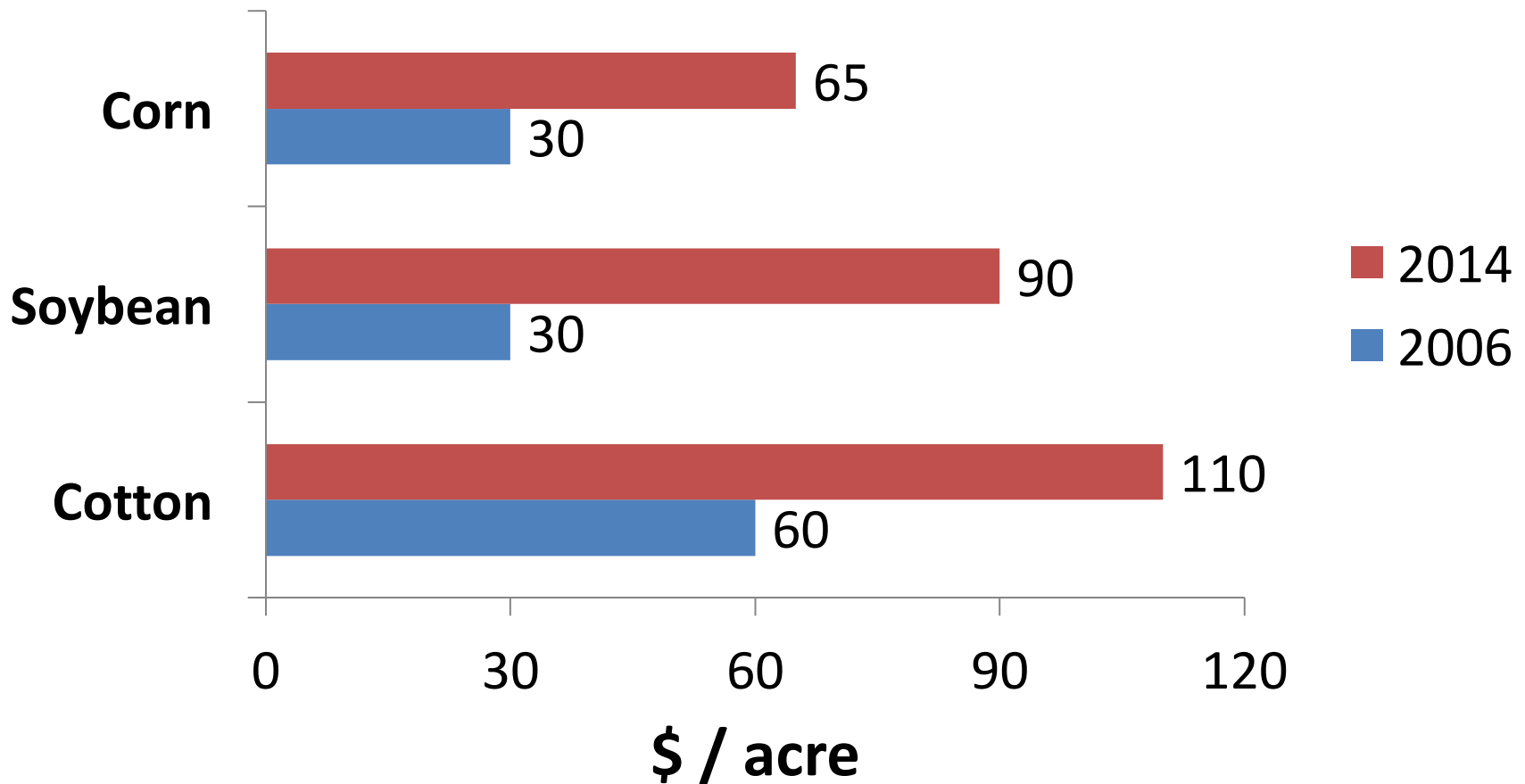


Hand weeding in cotton (2016)
~ 50% of cotton fields in TN
~ 80% of cotton fields in GA

Slide provided by Larry A. Steckel, U Tennessee



Tennessee Herbicide Costs 2006 vs. 2014



Adapted from Larry A. Steckel, U Tennessee



Trying out HWSC – Chaff Collection

Novel IWM Systems



2016-2020

Sites (6)





Perennial
Forage



2X Spring
Barley



Chaff Collection

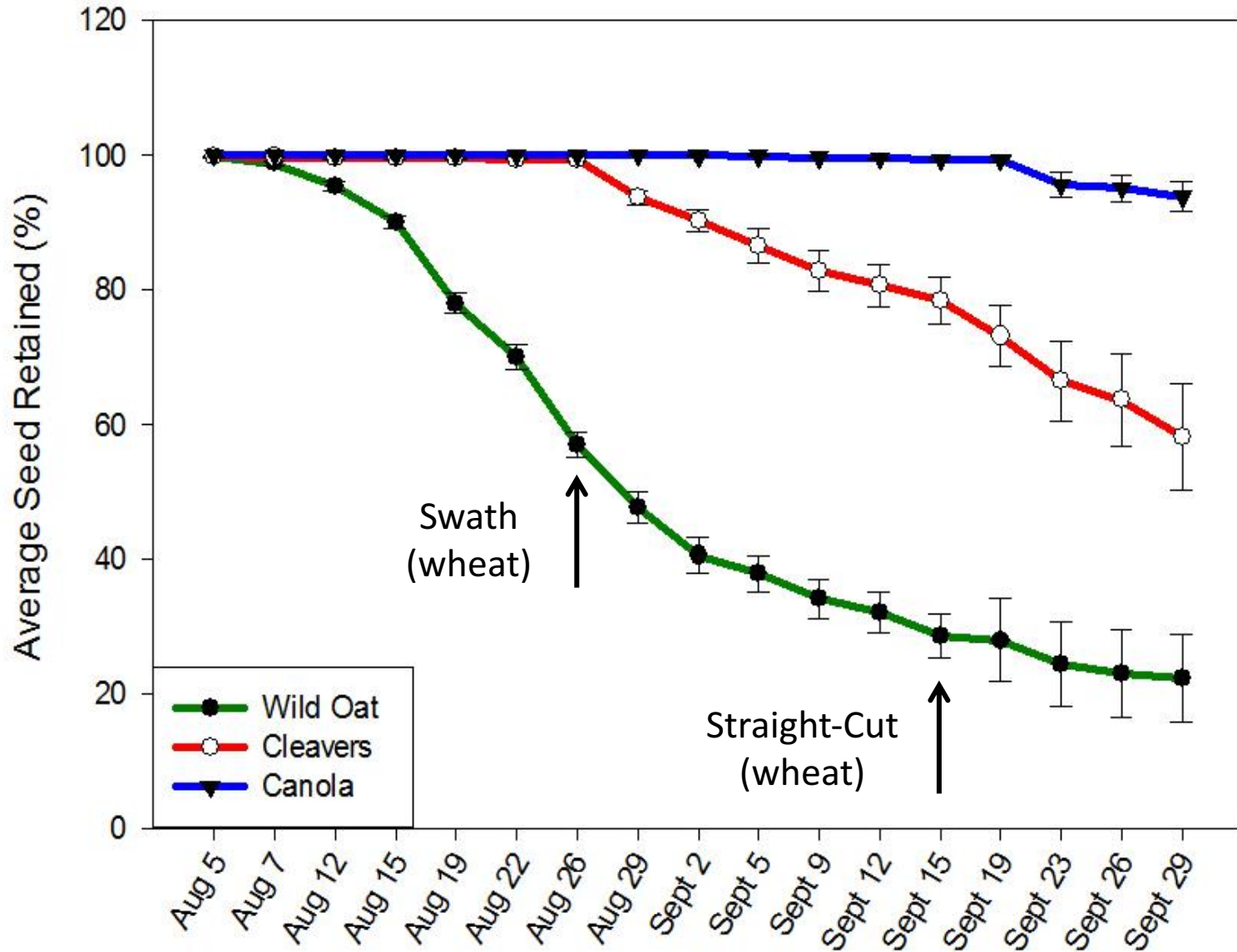


2X Barley
Silage



2X Winter
Triticale

Average Weed Seed Retention – Preliminary



Jim Grose
Rodono Industries Ltd.
Clive, AB





IWM Treatments

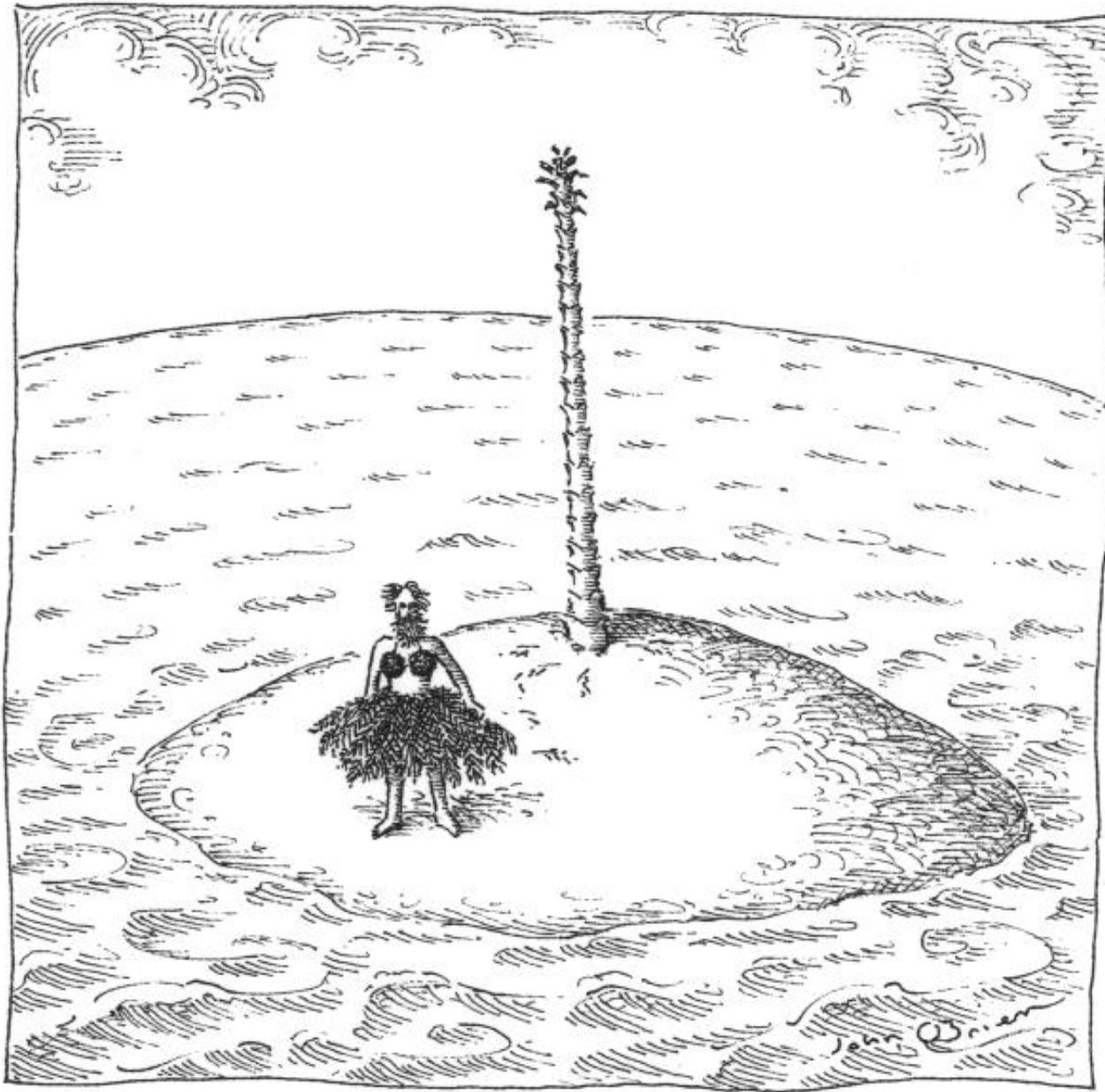
- in addition to **Diverse Rotations**

S = Seeding Rate (1.5 or 2 X)

H = Herbicide (0)

C = Chaff Collection

2016	2017	IWM	2018	IWM	2019	IWM	2020
Wheat	Alfalfa		Alfalfa		Alfalfa		Wheat
Wheat	LL Can		Wheat		RR Can		Wheat
Wheat	LL Can		Wheat		RR Can		Wheat
Wheat	LL Can		Wheat		RR Can		Wheat
Wheat	Faba		Bar		RR Can		Wheat
Wheat	Faba		Bar		RR Can		Wheat
Wheat	Faba		Bar		RR Can		Wheat
Wheat	Pea		Wwhe		RR Can		Wheat
Wheat	Pea		Wwhe		RR Can		Wheat
Wheat	Pea		Wwhe		RR Can		Wheat
Wheat	Sil Bar		Wtri		Sil Bar		Wheat
Wheat	Sil Bar		Wtri		Sil Bar		Wheat
Wheat	Sil Bar		Frye		RR Can		Wheat
Wheat	Sil Bar		Frye		RR Can		Wheat



Are You
Thinking
Long-Term
?



Agriculture Funding Consortium



Growing Forward 2 

A federal-provincial-territorial initiative



Agriculture and Agri-Food Canada

Agriculture et Agroalimentaire Canada



Alberta Barley