2019 Canola Industry Update

Curtis Rempel,

Canola Council of Canada

CANOLA DISCOVERY FORUM

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Market access and competitiveness

- More than 90% of canola is destined for export markets, and the impact of regulation and trade agreements is growing.
- At home and abroad, the CCC focuses on:
  - Resolving and preventing market access barriers
  - Improving market access through trade agreements
  - Advocating for policies that support canola's success

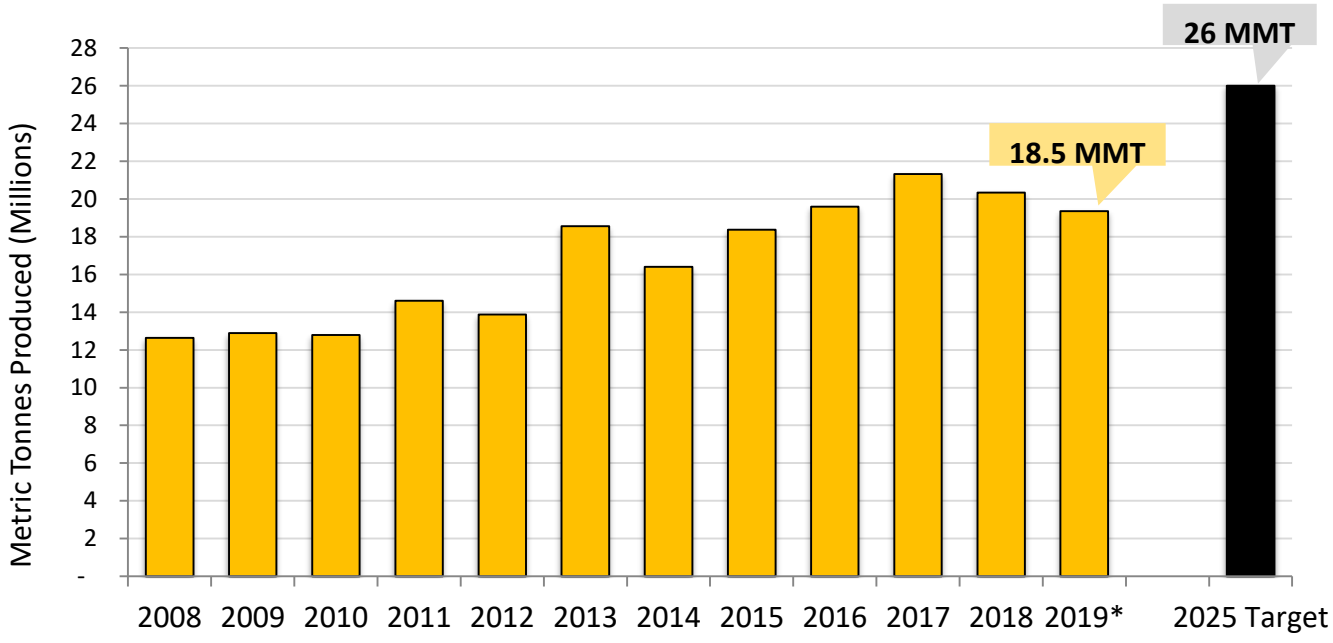
Brand health and development

- The CCC works to build canola's brand and reputation for superior value through:
  - Brand health activities, focused on maintaining and nurturing the canola brand in well-established markets, including the U.S. and Mexico.
  - Brand development activities, delivered in partnership with the CCGA, to differentiate and promote canola oil and meal in emerging markets such as China, South Korea, Thailand and Vietnam.

Sustainable supply

- CCC activities are centered on maintaining and building the supply of high quality canola for the Canadian canola industry.
- This includes four priorities:
  - Research leadership and coordination
  - Knowledge creation and transfer
  - Preparing for emerging threats
  - Supporting regulatory and market access efforts

2025 Production Target: 26 MMT



Source: Statistics Canada, Table 32-10-0359-01

**Estimate as of Sep 12, 2019*

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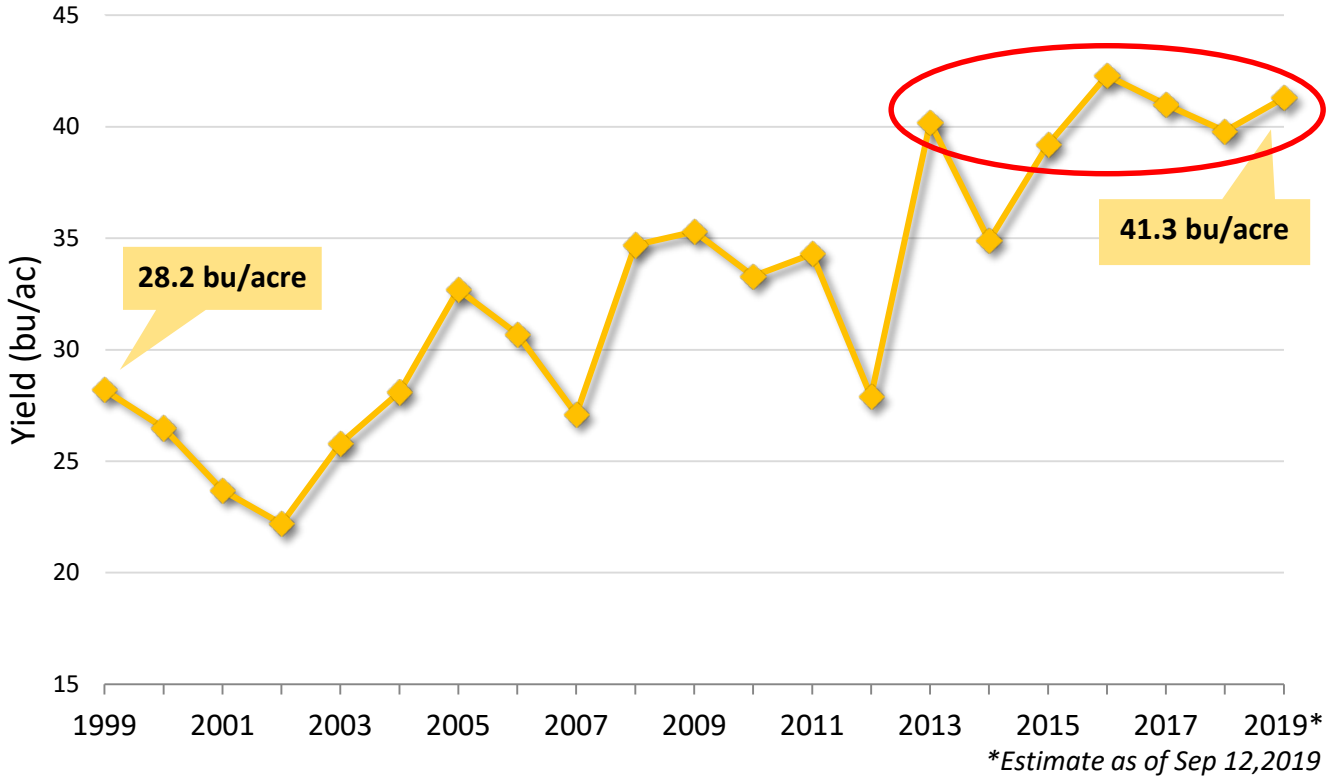
20-Year Canola Yield Trend

Source: Statistics Canada, Table 32-10-0359-01



**Estimate as of Sep 12,2019*

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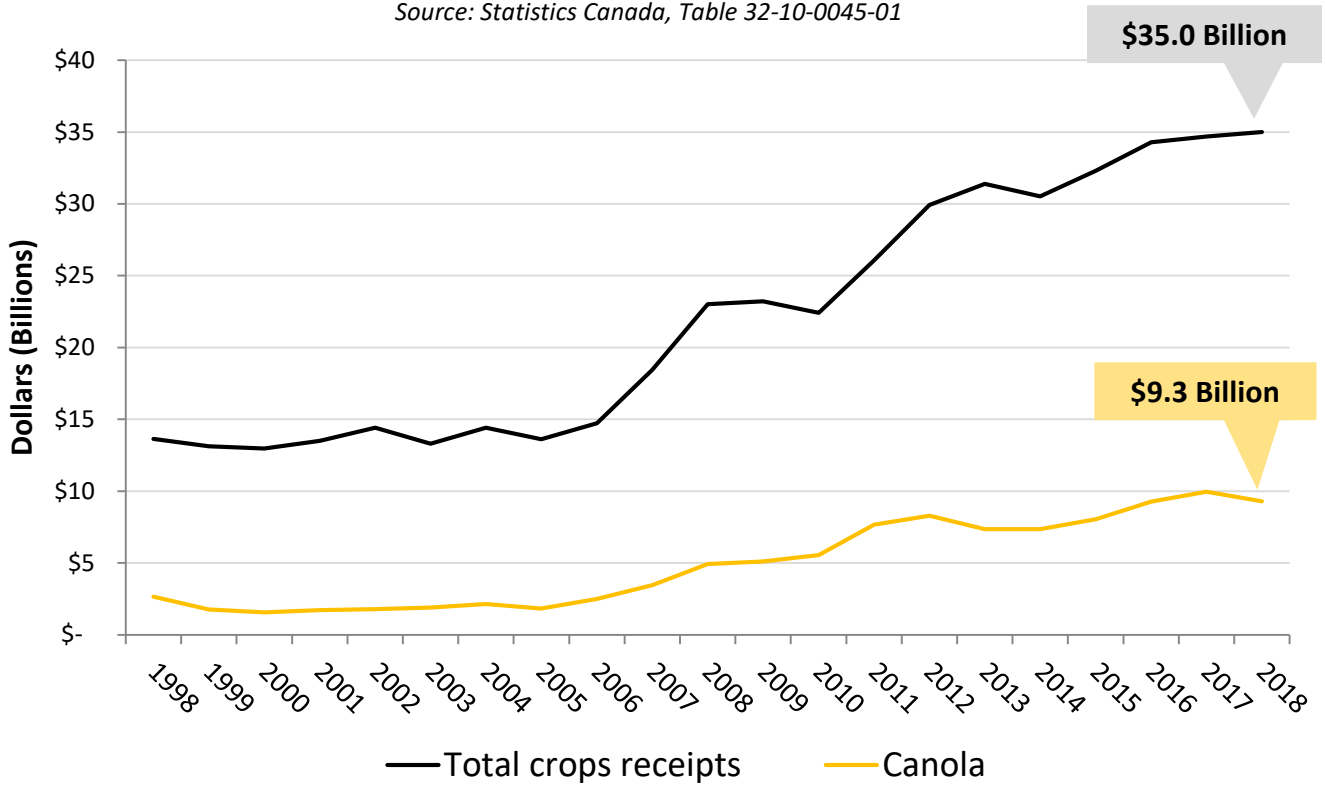
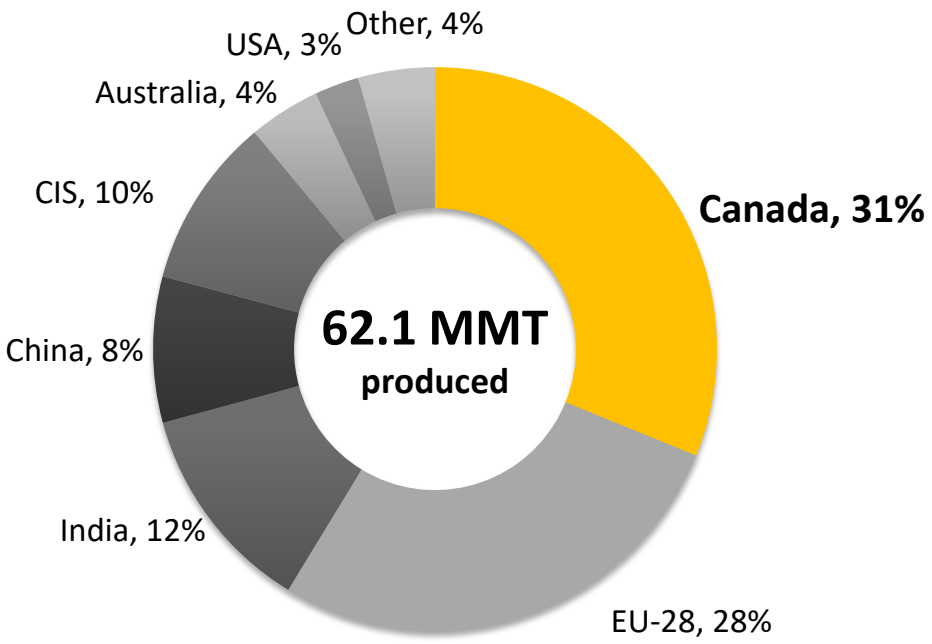
Farm Cash Receipts

Source: Statistics Canada, Table 32-10-0045-01



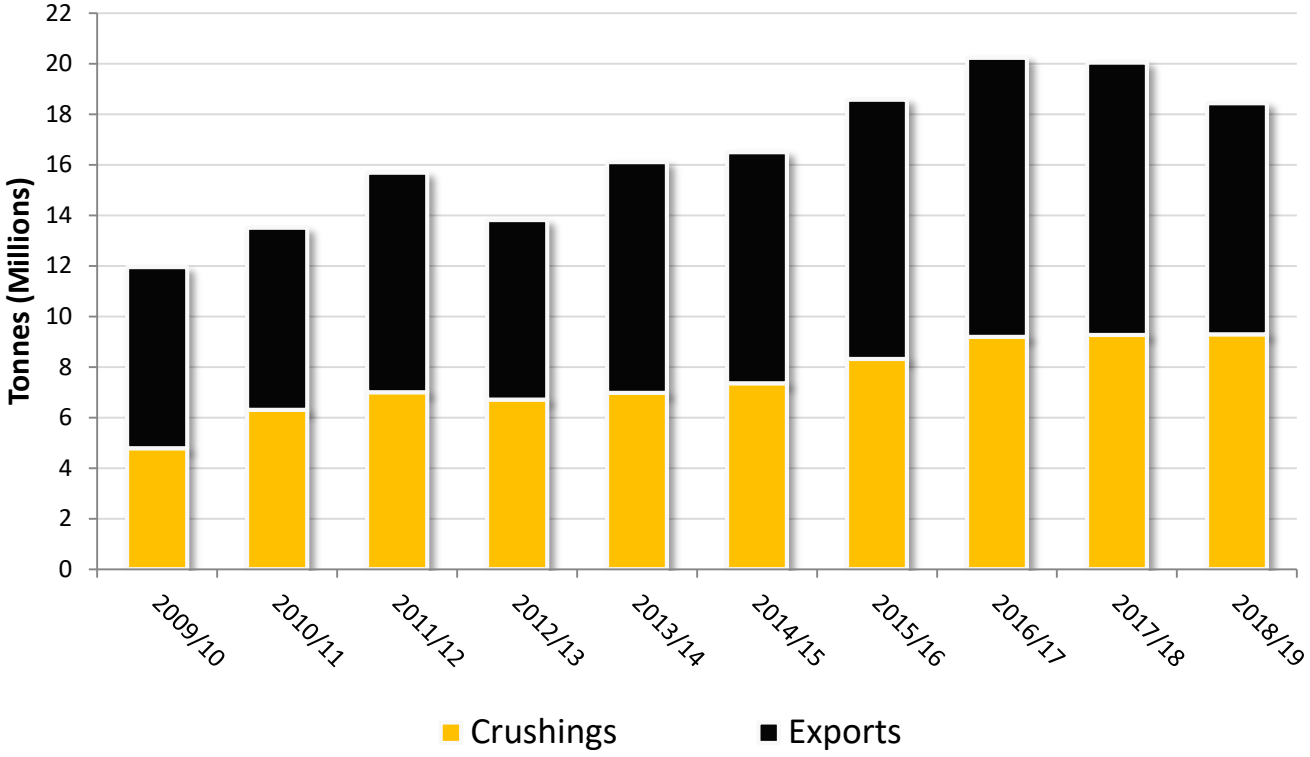
Global Canola/Rapeseed Production, 19/20F

Source: Oil World

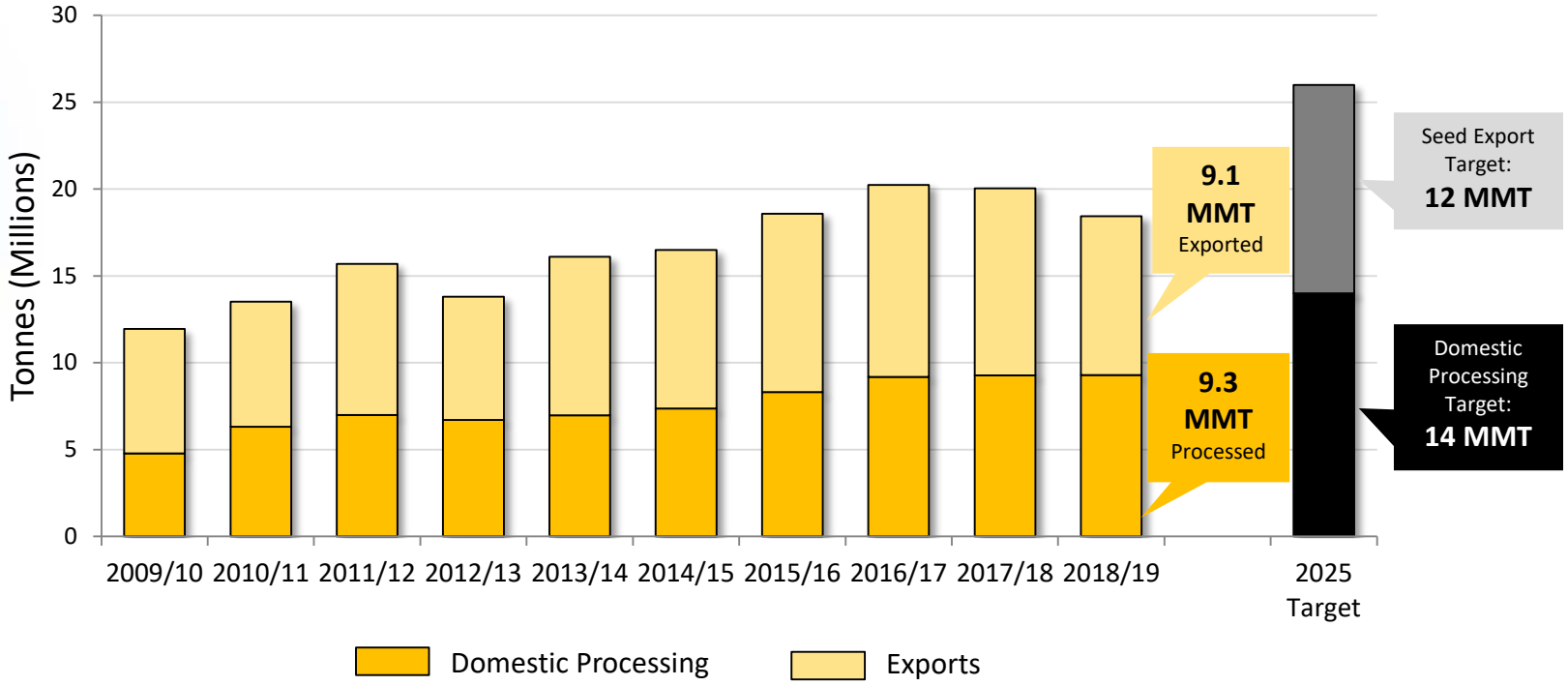


Canola Utilization

Source: Statistics Canada, Table 32-10-0352-01 & CIMTD



2025 Utilization Targets



Source: Statistics Canada

The Global Canola/Rapeseed Market

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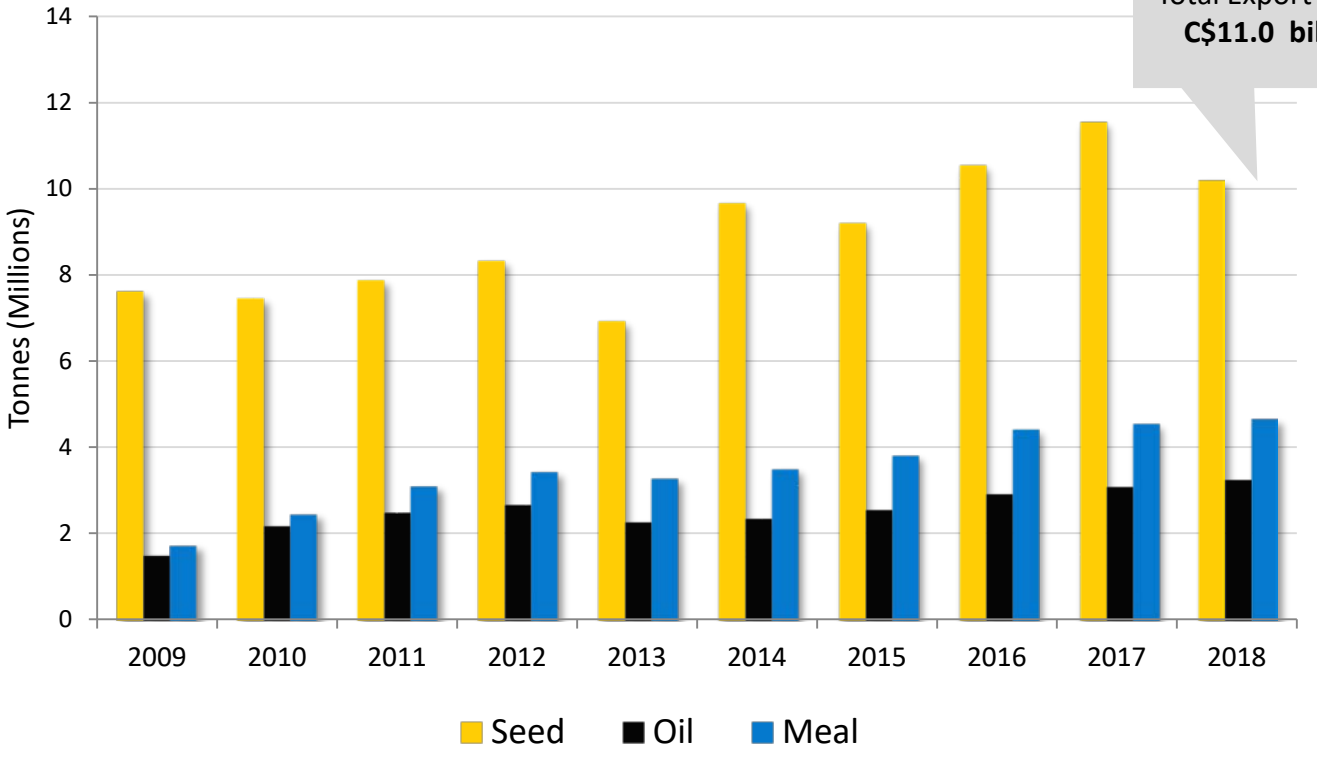
Canadian Canola Exports - Volume

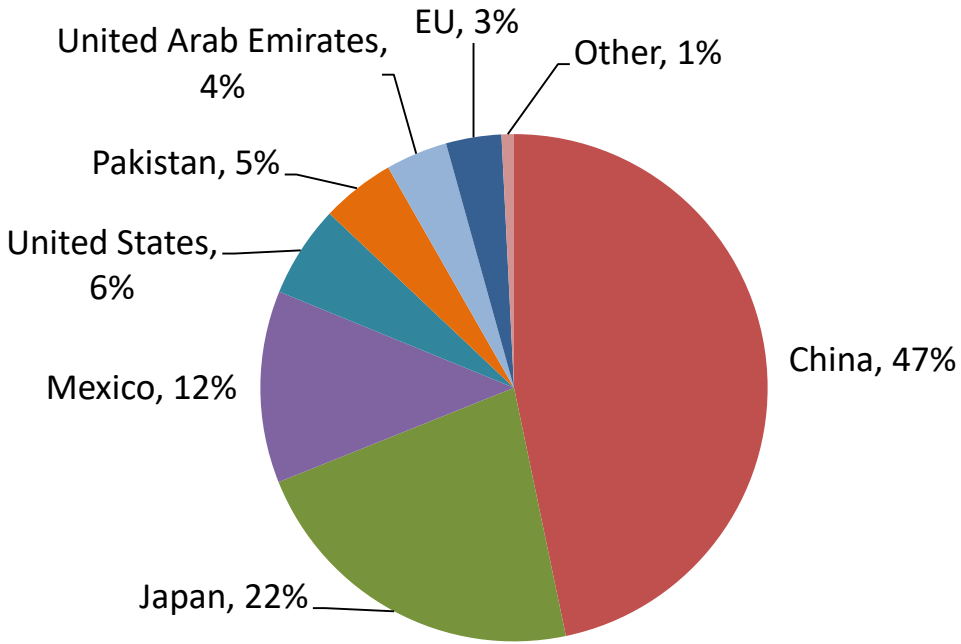
Source: Statistics Canada - CIMTD

2018
Total Export Value:
C$11.0 billion



Share of Canadian Seed Export Volume - 2018

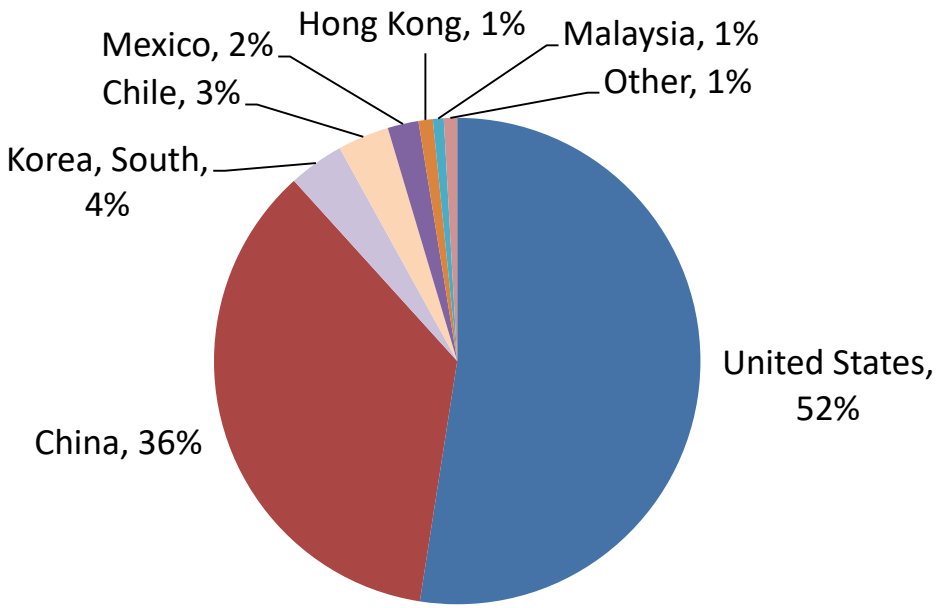
Source: Statistics Canada, CIMTD



2018 Canola Seed Exports: 10.2 MMT

Share of Canadian Oil Export Volume - 2018

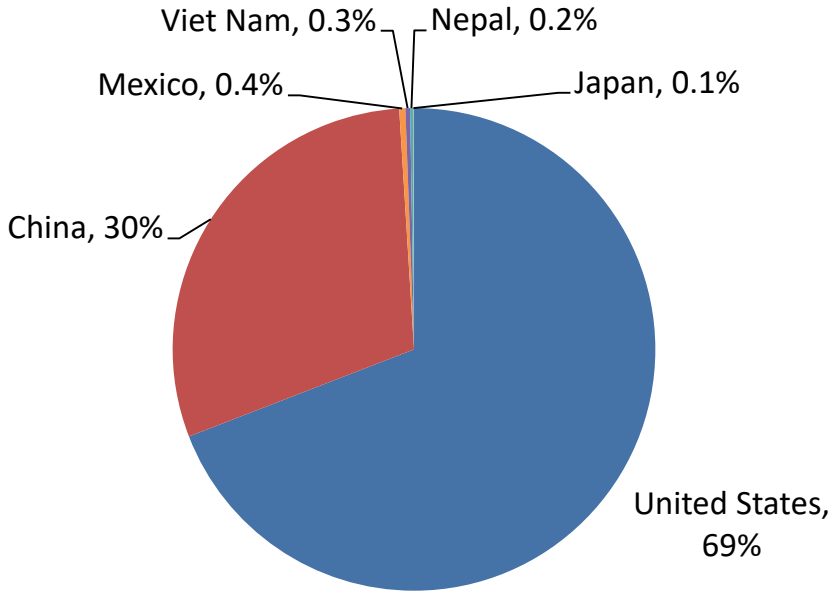
Source: Statistics Canada, CIMTD



2018 Canola Oil Exports: 3.2 MMT

Share of Canadian Meal Export Volume - 2018

Source: Statistics Canada, CIMTD



2018 Canola Meal Exports: 4.7 MMT

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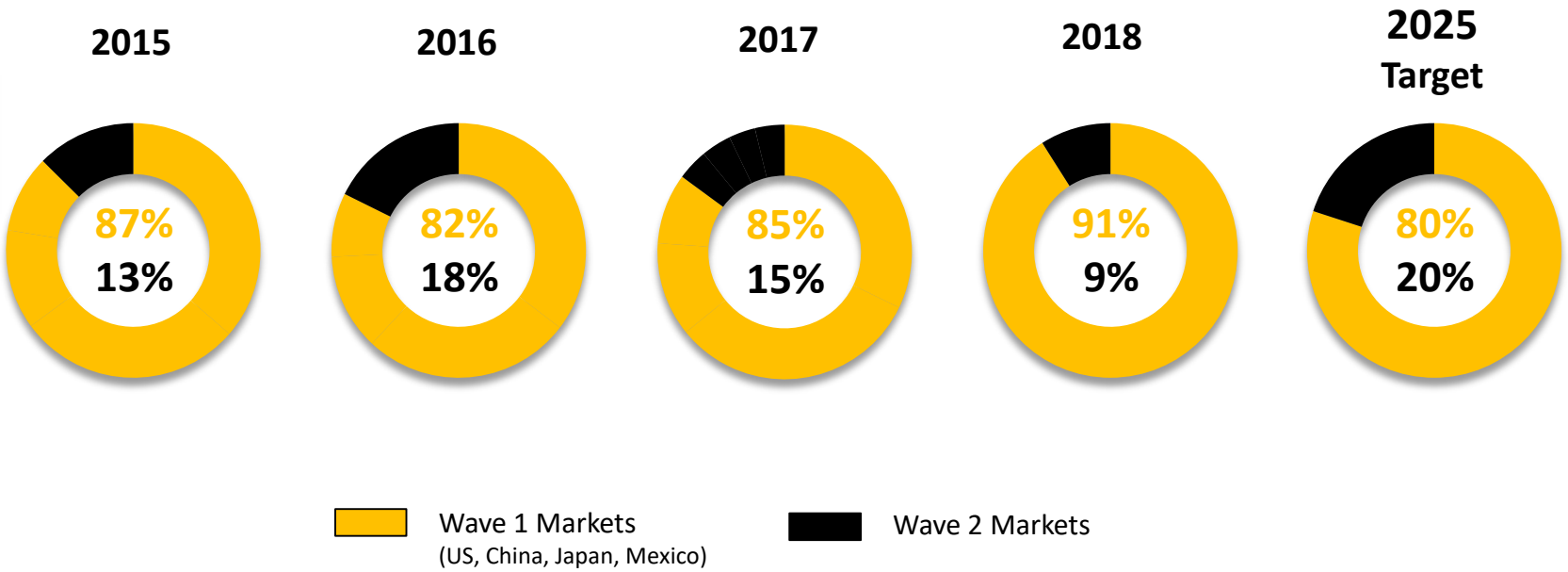
BENEFITS *to* U.S. DAIRY

Benefits to the livestock industry have quadrupled since 2006 to reach $1.9 billion – accounting for about one-third of the total economic impact. The biggest impact is felt in the U.S. dairy industry, where meal from Canadian-grown canola is increasing dairy yields by a litre per cow per day.

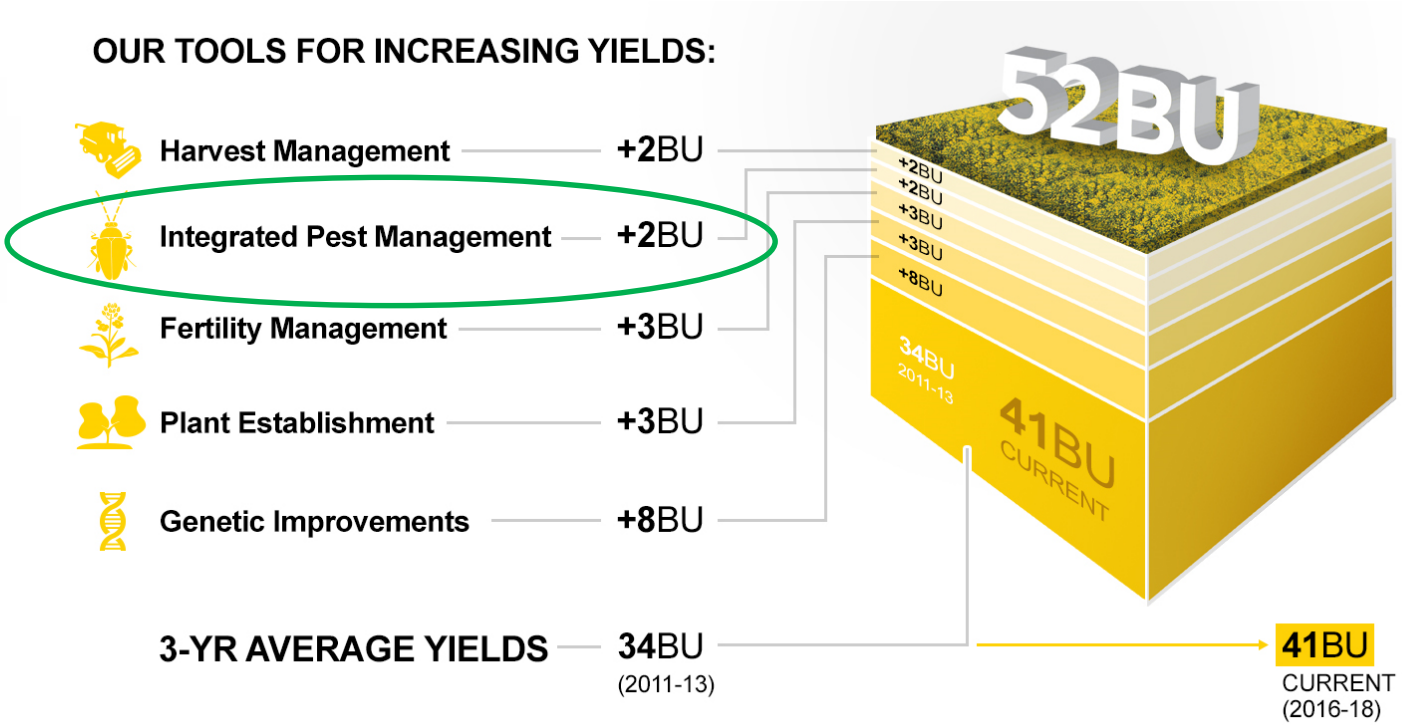
Export Shares: Wave 1 & Wave 2 Markets



52 by 2025: How we'll get there

STRATEGY: *DEMAND Driven* - meet forecast demand of 26 mmt canola

INCREASE Yield, Profitability, Sustainability; **REDUCE** Risk



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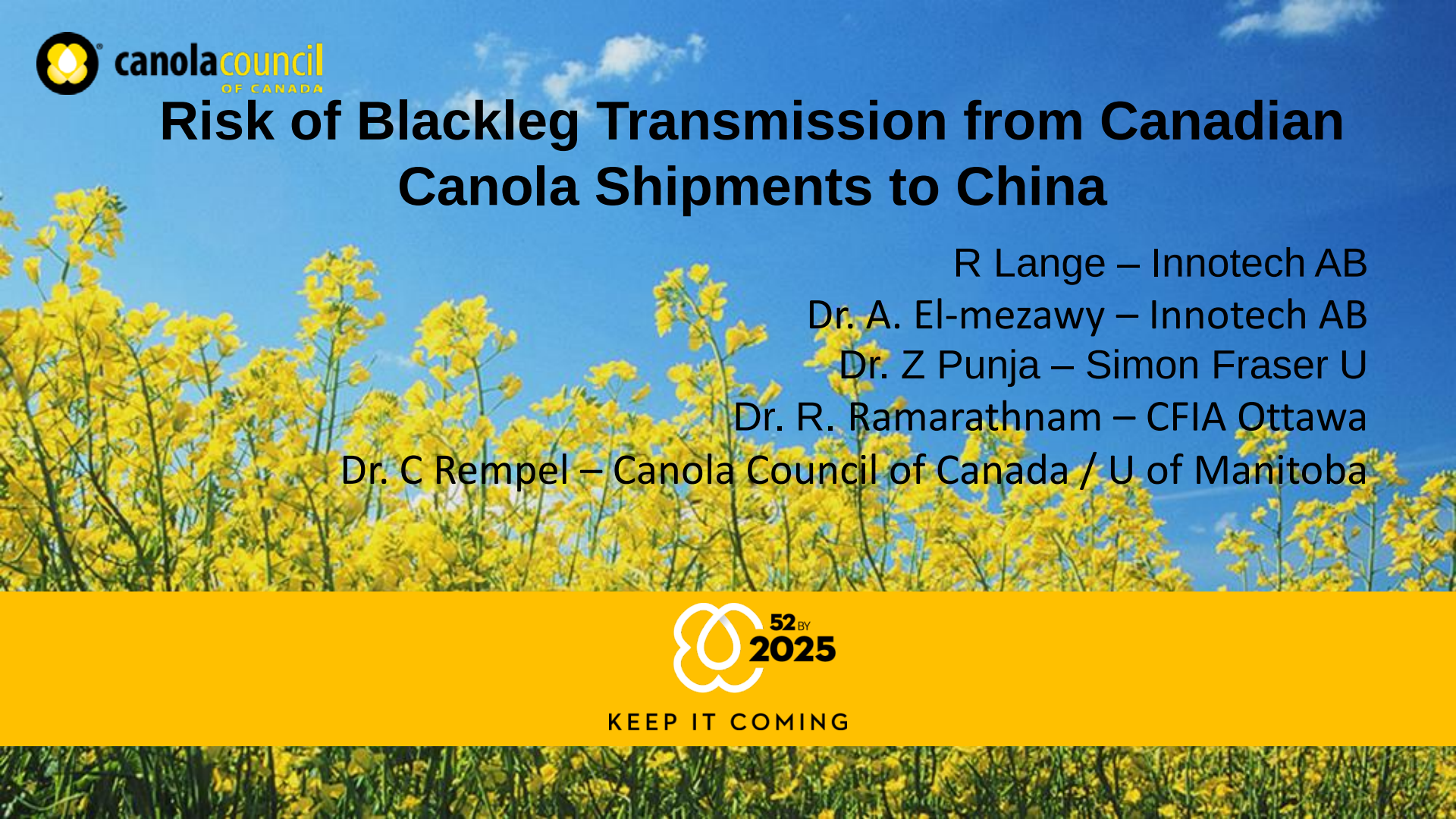
Weeds

- Weed seeds increasingly sensitive – trade
  - Peru, Vietnam, China, Canada
    - *Datura stramonium* – Jimson weed

Risk of Blackleg Transmission from Canadian Canola Shipments to China

R Lange – Innotech AB
Dr. A. El-mezawy – Innotech AB
Dr. Z Punja – Simon Fraser U
Dr. R. Ramarathnam – CFIA Ottawa
Dr. C Rempel – Canola Council of Canada / U of Manitoba



Blackleg – why a phytosanitary problem?

Plant Pathology (2008) 57, 652–664 Doi: 10.1111/j.1365-3059.2008.01841.x

Strategies to prevent spread of *Leptosphaeria maculans* (phoma stem canker) onto oilseed rape crops in China; costs and benefits

B. D. L. Fitt[a*], B. C. Hu[b], Z. Q. Li[c], S. Y. Liu[d], R. M. Lange[e], P. D. Kharbanda[e], M. H. Butterworth[a] and R. P. White[a]

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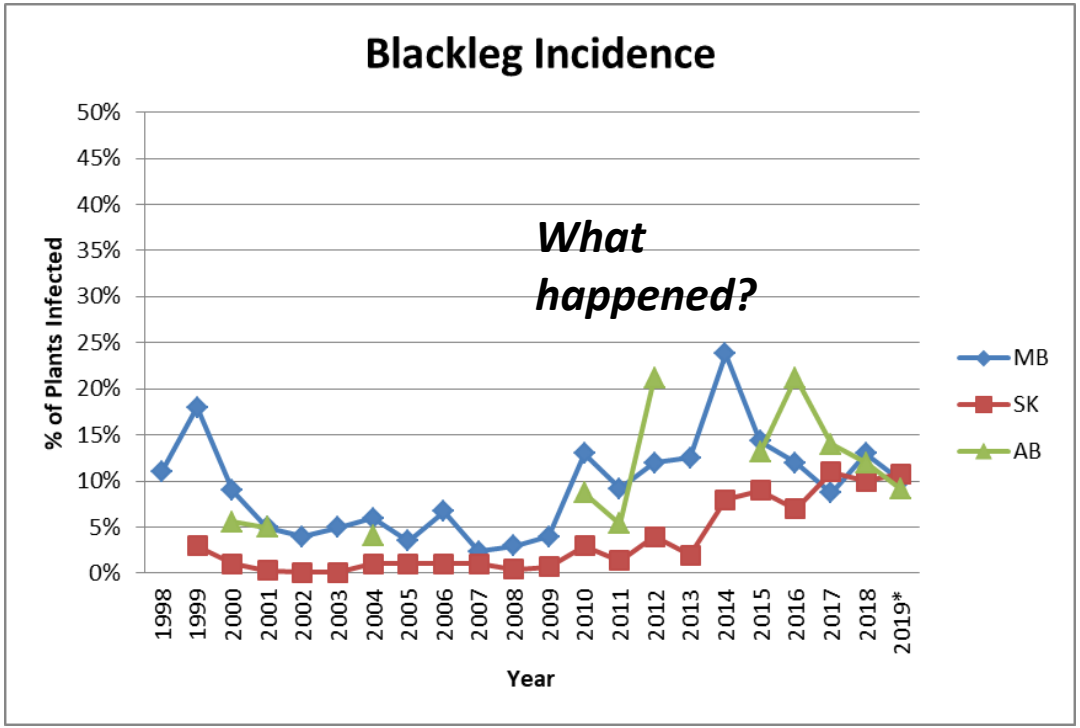
Leptosphaeria spp., phoma stem canker and potential spread of *L. maculans* on oilseed rape crops in China

X. Zhang[abc], R. P. White[d], E. Demir[a], M. Jedryczka[e], R. M. Lange[f], M. Islam[g], Z. Q. Li[h], Y. J. Huang[a], A. M. Hall[a], G. Zhou[i], Z. Wang[j], X. Cai[k], P. Skelsey[l] and B. D. L. Fitt[a*]

2019 Blackleg Disease Survey Results



2019 Incidence: MB-10%; SK-11%; AB – 9%

Completed by Provincial Governments

Australian Example:
2012 Eyre Peninsula on Group D Stubble

KEEP IT COMING

BEST MANAGEMENT PRACTICES FOR BLACKLEG ARE:

1. CROP ROTATION
2. SCOUT FOR THE DISEASE
3. FIELD RESISTANCE USED
4. ROTATION OF RESISTANCE GROUPS
5. FUNGICIDE USE

Dockage and Risk of Blackleg transmission

- "Dockage" is contaminating debris (plant parts, weeds, earth/stones etc.) found in seed shipments
- Up to 2.5% (w/w) dockage is allowed in "Commercially Clean" canola export shipments (Canadian Grain Commission standard)
- **Can (wind-dispersed) dockage act as a source of L. maculans inoculum?**
  - ***During vessel unload – how far does dockage travel?***
  - ***From seed spillage piles at port, along railroad tracks***
    - Dockage blowing off piles
    - Blackleg growing from dockage to seeds; infected plants

Conclusions

- Large quantities of spillage (tonnes, as in Vegreville) may transmit dockage and blackleg disease over short distances (25-50 m under our test conditions) during handling operations.
- Static spillage piles of canola seed are a poor source of blackleg inoculum: wind (natural or artificial) blowing over the spill pile for a duration of 4 weeks disperses some of the dockage material, with trace amounts of *L. maculans* DNA. No infections resulted
- Small quantities of spillage (hundreds of kg, as in BC) impossible to transmit *L. maculans*
- Best approach to mitigate risk seems to be to minimize spillage during handling (improve facilities) plus local sanitation (keep 25m radius around transfer points spillage-free

Pan-Canadian Water Monitoring PMRA review of Neonicotinoid Insecticides

Curtis Rempel
Mark Walker
Emilie Bergeron

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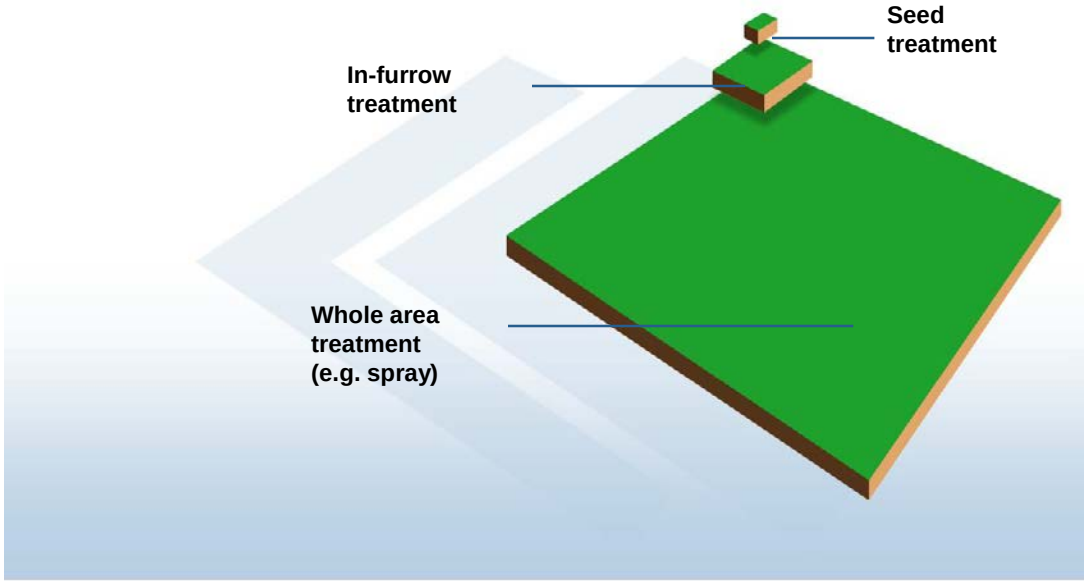
Modern Seed Treatments

The amount of seed treatment active ingredient is significantly and substantially reduced as compared to broadcast sprays or even in-furrow treatments

- Seed treatment has less impact on non-target organisms
- Seed treatment is compatible with Integrated Pest Management (IPM) approaches



The amount of active ingredient is often <10% of that which is applied to a broadcast-spray field, and the amount of the environment which is exposed to active ingredient is often <1% of that of broadcast sprays

Broad Acre NNIST – Not IPM??

- IPM framework: insecticide applications are reserved for situations where monitoring reveals that pest populations have reached levels of economic concern
- Only in specific instances can prophylactic use of pesticides be justified within IPM framework (i.e.NNIST on canola)
- Justified when following four conditions are satisfied.

1. Rescue treatments cannot keep pests under the economic injury level
2. Target pests have a high probability of causing economic damage
3. Pest(s) are widespread in their distribution and there is no practical or quantifiable way of determining where and when they will appear
4. Alternative control treatments are less efficacious and introduce a greater economic burden which includes (i) crop loss, (ii) increased input costs as well as (iii) negative impact on non-target organisms

Control of flea beetles in canola using NNIST meets all 4 conditions described above (Douglas and Tooker, 2015; others)

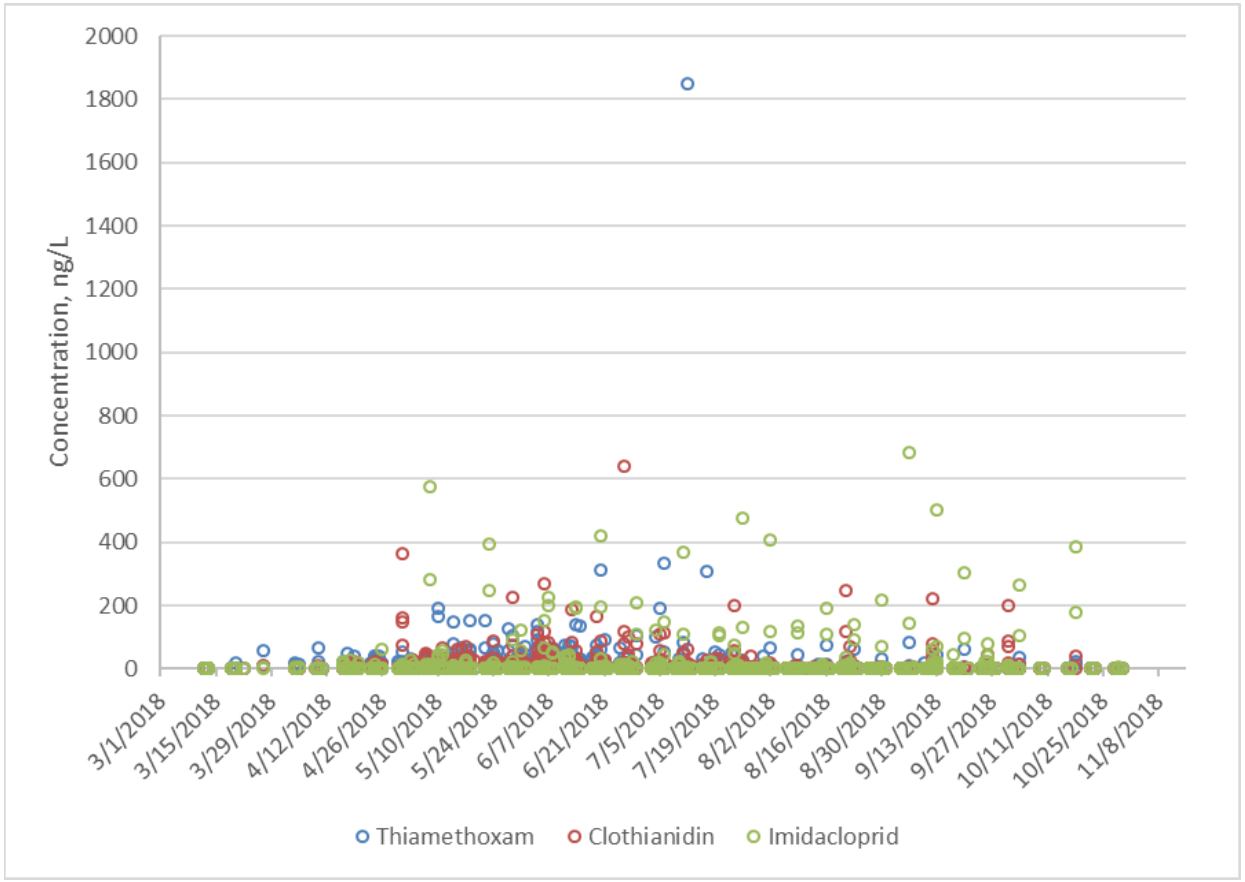
Western Canada Canola Production: Why Broad Acre Seed Treatment?

1. Lack of Predictive Model – flea beetle overwintering survival & emergence
    1. Despite significant historical investment in research, a functional predictive model has not been forthcoming.
    2. Difficulty in monitoring overwintering populations, a wide window for emergence, rapid movement/high mobility, and aggressive feeding habits are reasons why predictive models have been difficult to develop.
2. NNI Seed Treatment are targeted application – protection when canola is most vulnerable
3. Time efficient – grower is often still planting crops when needing to apply foliar insecticide if FB active

- Foliar insecticides are not preferable to seed treatment
  - Reactive (difficult to contact FB with insecticide)
    - Pest is highly mobile, rapid movement, voracious.
    - Damage in affected acres can annihilate crop in rapidly if not detected and treated
  - Non-selective. All insects in crop receive treatment
- Multiple foliar insecticide applications can be required to keep FB populations below ET – avoid significant yield loss
  - Multiple applications = increased cost (reduced profits).
  - Pyrethroid resistance??

All neonicotinoid surface water sample results across Canada

A total of 2,389 samples were collected and analyzed in 2018 from 315 monitoring sites across Canada.



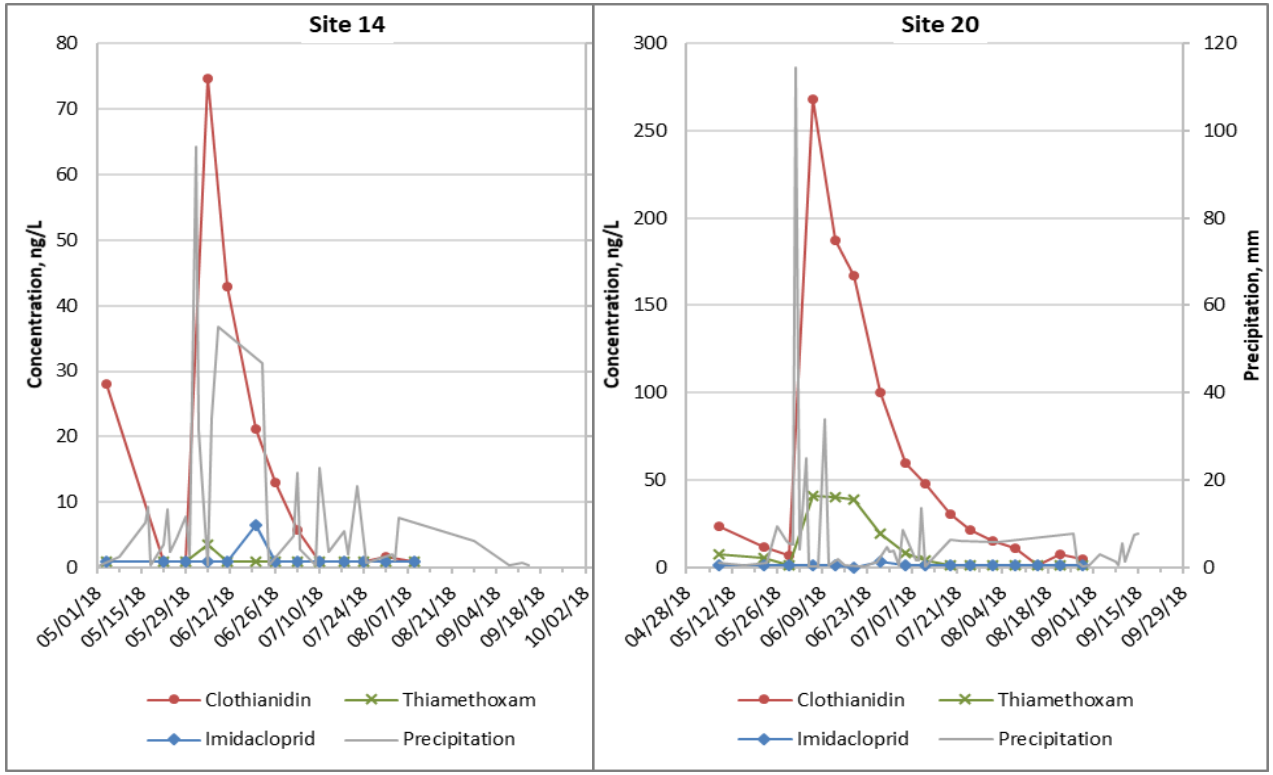
LOD <20 ng/L (ppt)

Water
MONITORING
2017
2018
2019 – wetland focus

2018 Prairie Pothole Water Monitoring

Prairies: 2018 Surface Water Monitoring	Flowing (134 Sites; 766 Samples)		Wetland (155 Sites; 1,405 Samples)	
	Thiamethoxam	Clothianidin	Thiamethoxam	Clothianidin
	Concentration (ng/L)			
Average, ng/L [1]	6.5	4.8	7.1	6.4
Median, ng/L [2]	< 1.4	< 2.7	< 1.0	< 1.0
Maximum, ng/L	126	111	1,850 / (310) [3]	365
	Samples and Frequencies			
Non-detects	530	640	960	800
	69%	84%	68%	57%
Samples less than PMRA proposed acute endpoint (T=9000; C=1500 ng/L)	766	766	1405	1405
	100%	100%	100%	100%
Samples less than PMRA proposed chronic endpoint (T=300; C=20 ng/L)	766	745	1403	1320
	100%	97%	99.9%	94%
Samples less than PMRA proposed chronic endpoint (CLO mesocosm NOEC = 281 ng/L)		766		1404
		100%		99.9%

Monitoring results from 2 sites: Neonic concentrations with daily precipitation



Wetlands in fields planted with Clothianidin treated canola seeds

Dissipation

Clothianidin concentrations typically declined by more than 80% within 2 weeks

Individual wetland DT_{50} values (DT_{50} = dissipation time 50%, the time required to observe a 50% decline in the peak concentration)

- ranged from 2 to 23 days for thiamethoxam in water with an average of 12 ± 6 days (n=12), consistent with known photochemical, hydrolytic and aerobic degradation kinetics in water.

No significant correlations existed between neonicotinoids concentrations and the amount of snowmelt water and runoff on sampling day, potentially dilution effect of runoff volume occurring with extensive snowmelt across the landscape.

Higher precipitation values were also associated with low or non-detectable concentrations.

- 99.9% of all canola planted seed is treated with a neonicotinoid insecticide, as are many other crops seeds that are planted and canola is planted on at least 1/3 of the arable acres in western Canada in any given year.
- Conservation Tillage – stubble reduces rate and amount of runoff
- Vegetative Filter or Buffer Strips

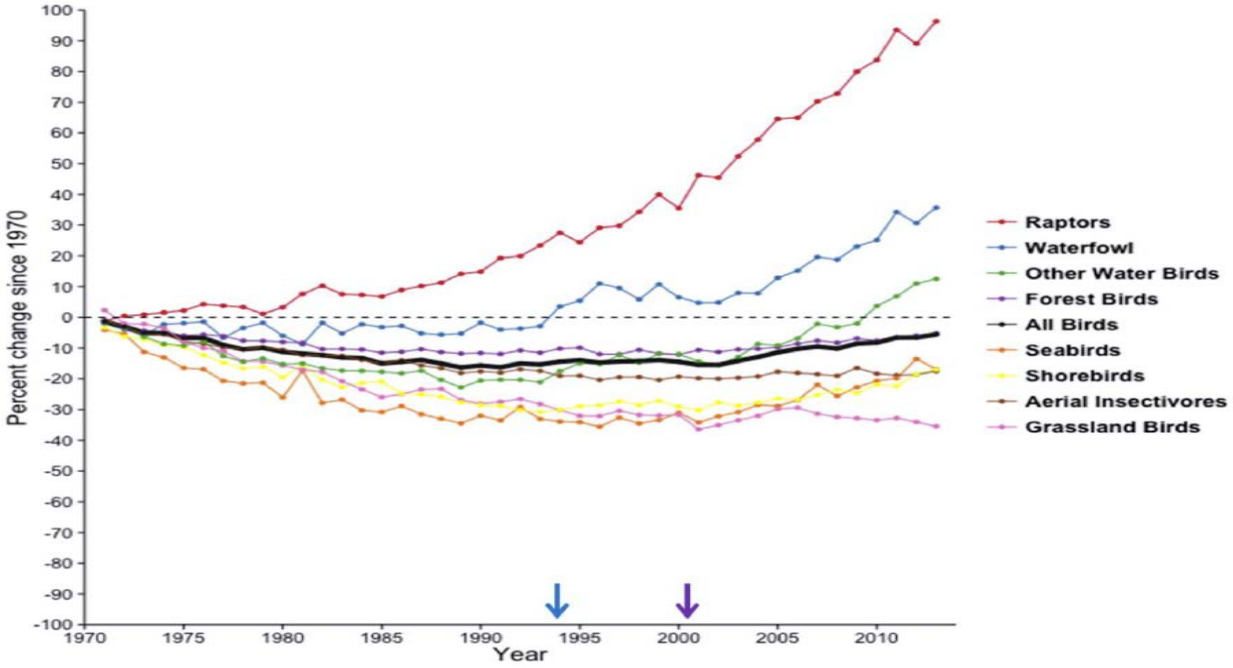
Avian data

Data to evaluate effects of neonics on aquatic inverts and birds

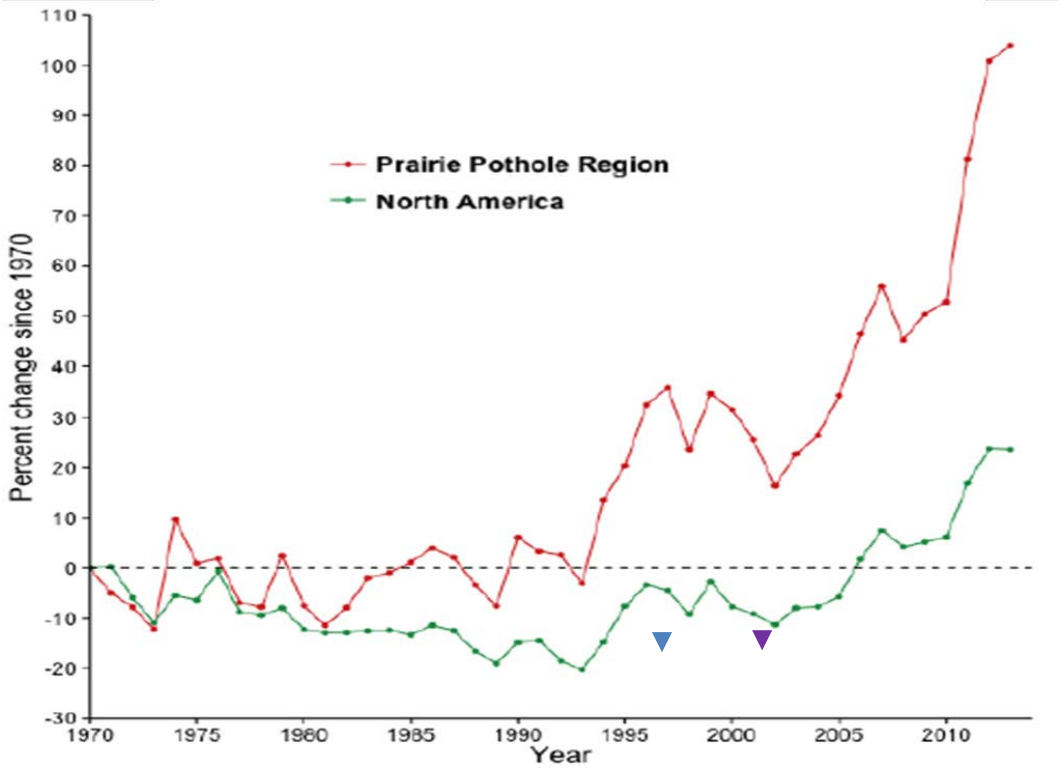
- Neonicotinoids have the largest dataset to investigate risk to aquatic invertebrates of any pesticide.
- > 20 years of extensive use that allow evaluation of environmental observations to determine if detrimental effects are occurring
  - **Birds are a good *bioindicator* for potential effects on aquatic invertebrates** that many of them rely on for food (i.e., if aquatic invertebrates are being severely impacted then bird populations will be negatively impacted.
  - In general, populations of birds that are the best indicators of potential effects on aquatic invertebrates are doing better since the introduction and adoption of neonics.
  - Evaluations have found these species are often doing better in regions of high neonic use than other regions, (a reflection of habitat and land management) but provides further evidence that ***neonic use is not impacting these populations.***

Bird populations have generally increased since introduction of neonics

- Graph shows change in population trend (trajectory) across all of N. America as compared to 1970 for bird guilds (birds grouped by common feeding, habitat, or behavior) based on the North American Breeding Bird Survey (BBS) which is a robust and publicly available database of yearly bird surveys.



Trends for birds that feed primarily on aquatic invertebrates



American black duck
Bufflehead
common goldeneye
eared grebe
horned grebe
lesser scaup
marbled godwit
northern waterthrush
pied-billed grebe
red-necked grebe
ruddy duck
Willet
Willson's phallarope
wood duck

based on the North American Breeding Bird Survey (BBS) which is a robust and publicly available database of yearly bird surveys.

Bird populations have generally increased since introduction of neonics

Summary: Avian population trends

- No apparent correlation between neonic use and vulnerable bird population trends based on Breeding Bird Survey data
  - Guild level population trends are promising
    - Performance of some species during certain time periods is not satisfactory
      - Evidence performance is unrelated to neonics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Thanks
Questions and / or Comments
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