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Weed Control in Canola Flax & Dry Bean

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CANOLA ITEMS

Background

- Over last few years an increasing number of cases of herbicide damage have come through Crop Protection Lab submissions that are not related to the herbicide applied or can be attributed to drift
- Diagnosis – sprayer contamination
- Sprayer contamination is problematic in highly diversified cropping systems in Saskatchewan
- Occurs when herbicide deposits form during previous applications that are removed when later applications made to sensitive crops

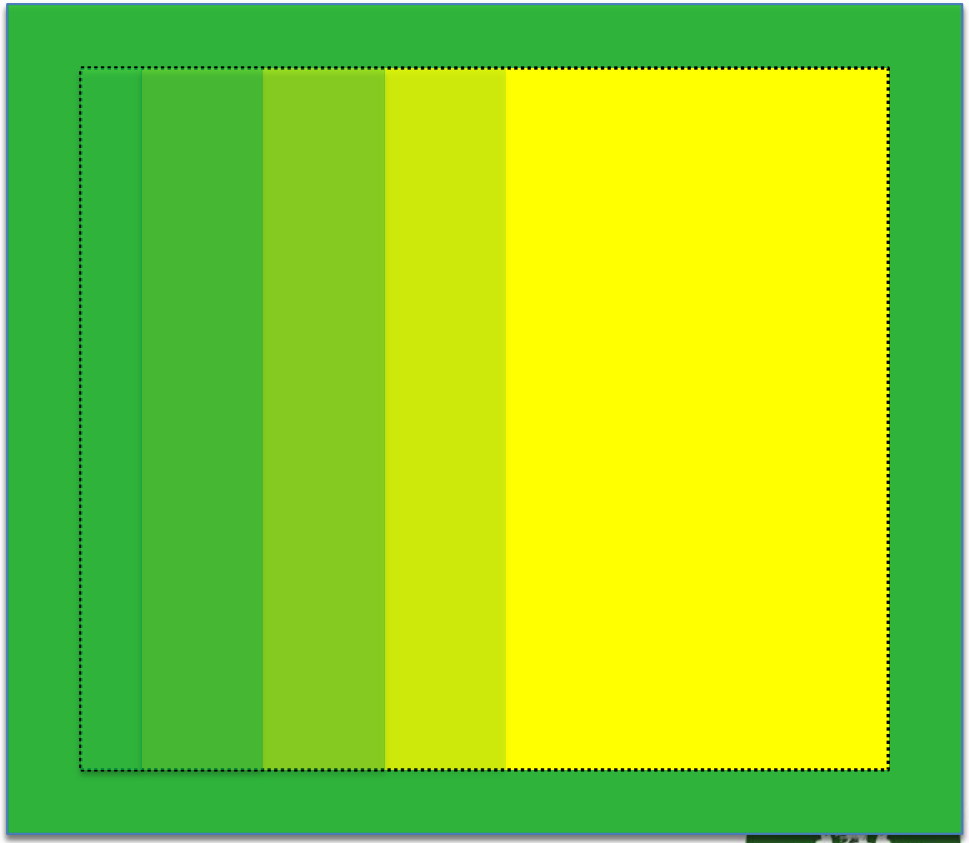
Background

- Of cases sent to the Saskatchewan Agriculture Crop Protection Laboratory most involve *Liberty* applied to Liberty Link canola
  - Adjuvants in *Liberty* are soapy and act as strong cleansers
  - Can also be other herbicide applications involving solvent based adjuvants such as *Merge* or *Turbocharge*
- In most cases a Group 2 herbicide is the contaminant herbicide
  - Very high herbicide activity at very low amounts
  - Also occasionally see symptoms suggesting Group 4 herbicide as the contaminant
  - Canola is very susceptible to both herbicide groups
  - Occasionally seen in pulse crops as well
- Can occur many loads after contaminant herbicide was last applied

Typical field patterns in tank contamination cases

Scenario #1:

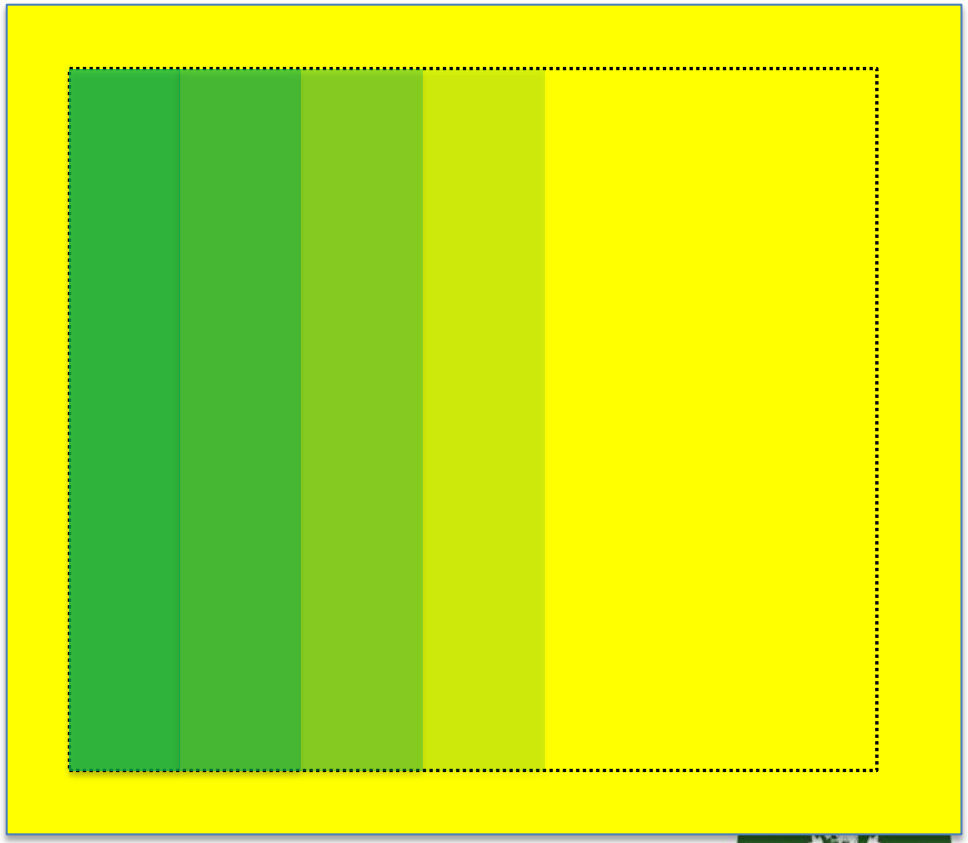
- Damage most severe on first tank sprayed
- Each subsequent tank load is less injured than the previous
- **Proposal:**
- *Liberty* added at early fill
  - Concentrated *Liberty* and circulated through spray plumbing and tank while filling continues
- Each successive tank load is less and less contaminated as the contaminant is removed from the sprayer plumbing.



Typical field patterns in tank contamination cases

Scenario #2:

- First tank shows little to no injury
- 2nd and subsequent tanks exhibit less and less damage
  - similar pattern to Scenario #1

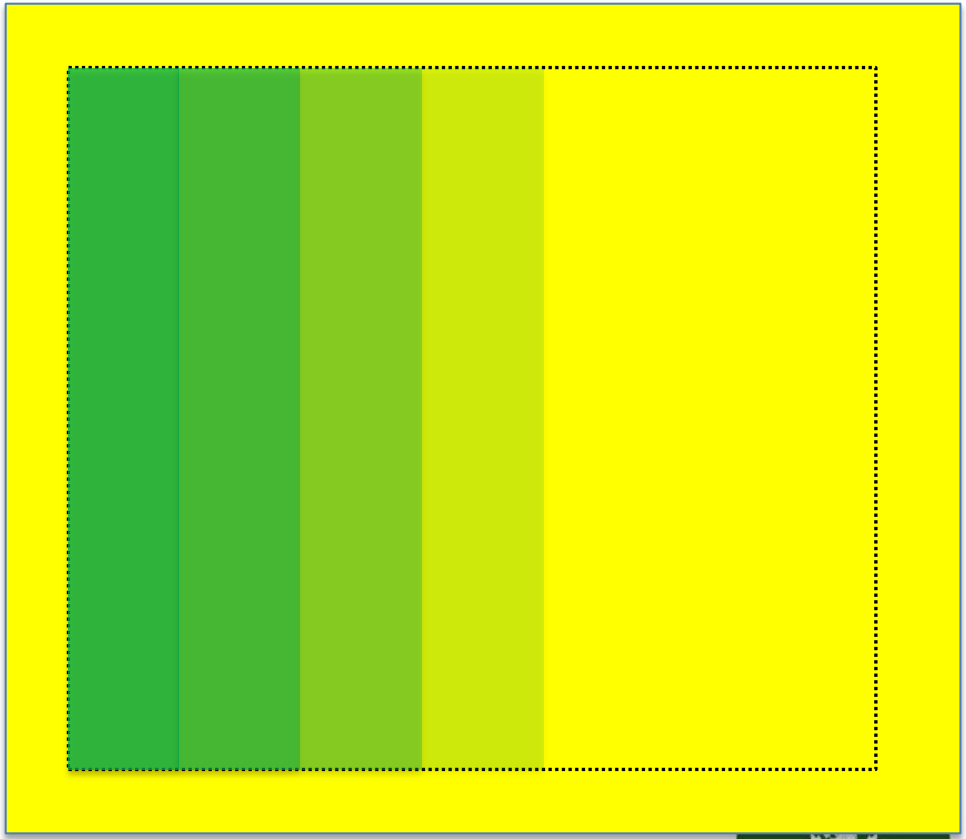


Typical field patterns in tank contamination cases

Scenario #2:

- Proposal:

1. *Liberty* added at late fill without agitation
   - No opportunity for *Liberty* to remove tank contaminant in amounts large enough to injure while filling first tank
2. Spray solution sits in sprayer plumbing without agitation while sprayer is refilled with water allowing *Liberty* solution to remove of a portion of the contaminant at each fill.



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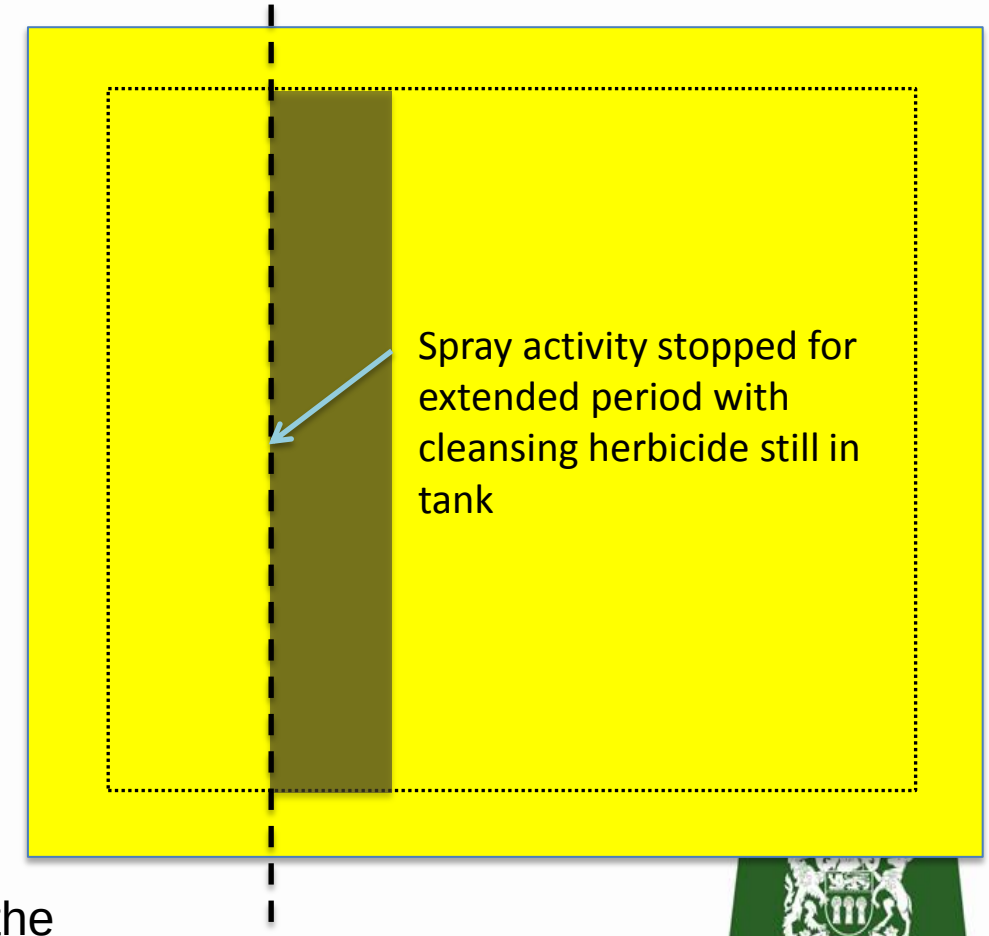
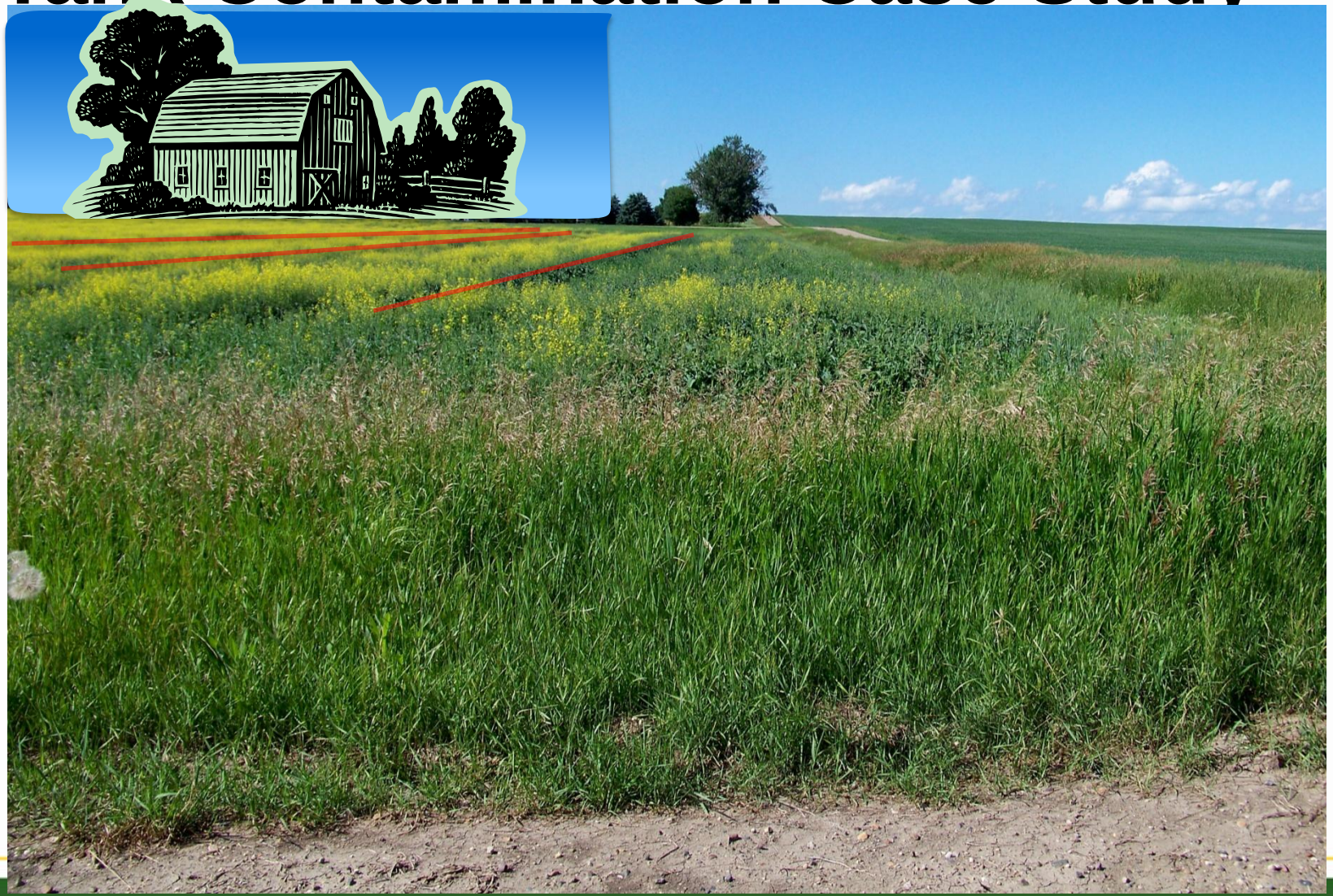
Typical field patterns in tank contamination cases

Scenario #3:

- Entire field is relatively uninjured except for a single tank load.
- *Liberty* added late in fill as per scenario #2
  - But agitation continues through the fill
  - No opportunity for significant removal of contaminant
- Spraying stopped and Liberty spray solution left in tank for extended period
  - Entire contaminant load in sprayer removed at once
  - Higher concentrations of contaminant are present in the first tank sprayed following the delay and little injury in later tanks



Tank Contamination Case Study



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Tank Contamination Case Study

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Tank Contamination Case Study

Contributing Factors?

- Compressed spring window made for sporadic spraying activity = sprayers sat with product in the tank for longer periods without getting cleaned
  - “We are going to be spraying the same thing next time anyway. What is the point of cleaning?”
- Assumption that several tank-loads of glyphosate (or other herbicide) will clean residues from the tank
  - New glyphosate formulations have “ethoxylated tallow-amine” adjuvants
    - New adjuvants are “fatty” vs. older formulations that were alcohol based
    - Tallow amine formulations may add oily film layers if sprayers not cleaned

Contributing Factors?

- Dow AgroScience indicates that florasulam (*PrePass, Priority*) will precipitate (form solids and settle) in the presence of K+ salts of glyphosate (540 g/L)
  - In 2013 *PrePass* frequently sole Group 2 in 2013 sprayer history
  - If topping up *PrePass* use IPA or DMA salts of glyphosate only.
- "Stale *Liberty*" myth? – since *Liberty* is already a water based formulation
  - Diluting with more water is not going to cause any changes to the product.
  - Product is not broken down or transformed into something else by hydrolysis

Good Sprayer Sanitation Guidelines

- Sprayer should be emptied and cleaned thoroughly if the engine/agitation is going to be shut off for more than an hour
  - Absolute minimum water rinse
  - Preferably full clean protocol especially if stopped for more than a couple of hours
- Leave water sitting in the sprayer for short term (summer) storage and drain prior to resuming spraying
- Utilize detergent as well as ammonia in the cleaning operation to remove oily films
  - Contrary to kitchen cleanser ads, ammonia is not the best grease cutter
  - Ammonia is intended to increase solubility of certain herbicides in water

Good Sprayer Sanitation Guidelines

- When cleaning
  - start immediately after spraying stops
  - Leave cleaning solution in sprayer for an extended period (over night)
  - Clean tank periodically even if not changing chemicals
    - Tank hygene = personal hygene

Tank cleaners

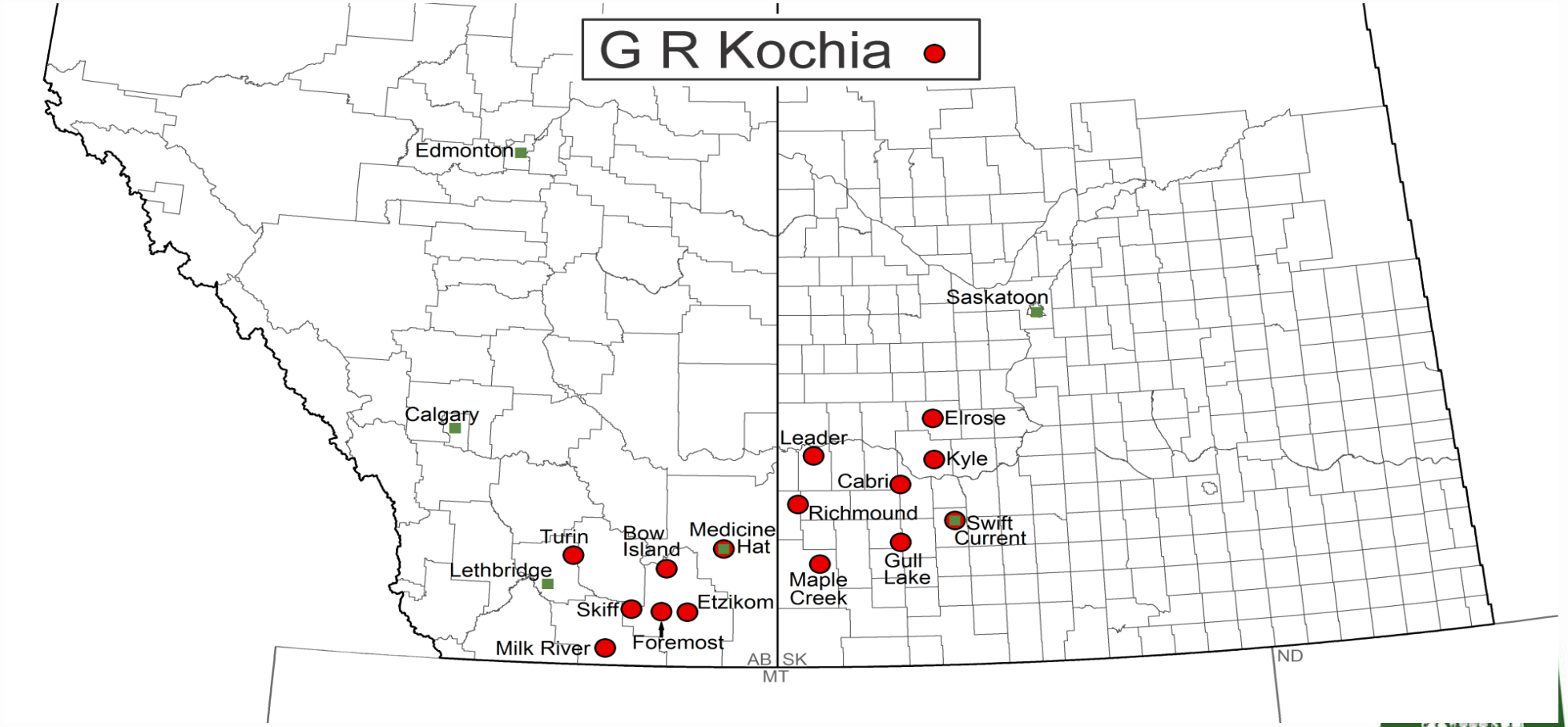
- Ammonia
  - Raises pH of solution making some pesticides more soluble
  - Light grease cutting
- Detergent
  - Heavy grease and oil dispersion
  - Makes water and oil mix!
- Surfactant
  - Breaks surface tension of water to prevent droplet formation
  - Better flushing of cleaning solution from system

Tank cleaners

- Commercial all-in-one cleaners
  - Look for all characteristics (pH rise, detergent, surfactant)
  - Good simple option for most situations

Tumbleweed resistance patterns

Photos Pioneer Coop AgTeam


G R Kochia
Edmonton
Saskatoon
Calgary
Elrose
Leader
Kyle
Cabri
Richmond
Swift Current
Turin
Bow Island
Medicine Hat
Gull Lake
Lethbridge
Maple Creek
Skiff
Etzikom
Foremost
Milk River
AB
SK
MT
ND

FLAX ITEMS

Weed Control Issues in Flax

- Flax is a relatively non-competitive crop
  - Relies heavily on herbicide based weed management
- Limited herbicide options
  - Either easy or difficult
- Sensitive to herbicides yet hard to control
- Problem weeds – kochia and Redroot pigweed

Preseed Glyphosate injury?

Be careful

- Flax can not be emerged
- *Rare but possible that residue from straw may be transferred – high humidity & cool conditions (irrigation)*

RR Canola tank mixes with glyphosate***

- Aim (CleanStart prepack option)

***Glyphosate should never be applied on its own

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Weed Control by ingredient

- MCPA – is the foundation of broadleaf weed control in flax
  - Mustards, and easily controlled weeds
- Bromoxynil – combined with MCPA (tank mix or premix formulations) for additional control
  - smartweeds and wild buckwheat primarily
- Clopyralid – as Lontrel or premixed with MCPA in Curtail M
  - Activity in perennial broadleaf weeds like thistles and dandelion

Weed Control by ingredient

<u>Annual grass weed control</u>

- Clethodim – *Select, Centurion, Arrow*
- Sethoxydim - *Poast Ultra*
- Quizalofop – *Assure II, Yuma GL*

- All control a wide range of annual cool and warm season grasses as well as quackgrass
- Quizalofop more active on annual brome species than others

Authority

- sulfentrazone
- Kochia, pigweed, wild buckwheat, lamb’s-quarters
- Chickpea, flax, field pea, sunflower
- Applied to soil surface and rainfall/irrigation incorporated
- Also available as Authority Charge
  - Combination with Aim for rapid burndown intended to be mixed with glyphosate

DRY BEAN ITEMS

Dry Beans

Herbicides for dry bean market classes

	Navy/white	Pinto	Yellow
Basagran/Basagran Forte*	√	√	√*
Clethodim (Select, Centurion, Arrow)	√	√	
Dual II Magnum	√	√	
Edge	√		
Eptam	√	√	√
Frontier Max	√		
Imazethapyr (Pursuit and others)		√	
Poast	√	√	
Quizalofop (Assure II, Yuma GL)*	√*	√*	√*
Trifluralin	√	√	√
Viper ADV* (Solo + Basagran Forte mix)	√*	√	*

Viper ADV (Solo + Basagran Forte)

- New registration for dry beans in many market classes
- Post –emergent foliar
- Grass and broadleaf activity
  - Two modes of action for broadleaf weed resistance management (Group 2 and 6)

Viper ADV (Solo + Basagran Forte)

- Same cautions as Solo (cool conditions) or Basagran (hot humid conditions) for injury
- Carries the warning about variability in varietal tolerance
- Has suppression of Japanese brome

Other new additions

- Assure II has control of downy brome
  - Japanese brome also likely susceptible
- Equinox removed by BASF and supplies almost exhausted from retail level

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