

# *Canada's Use of Buffer Zones for Risk Mitigation*



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# *Overview*

- **Agricultural buffer zone modification proposal**
- **Sensitive habitat challenges**

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# *How to Mitigate Drift?*

- **Buffer Zones**
  - = No spray zones
  - = Setbacks
- *Distance between the point of direct application and the closest downwind edge of a sensitive terrestrial or aquatic habitat*

# *Labelled Spray Drift Statement*

- *Aerial application: DO NOT apply during periods of dead calm. Avoid application of this product when winds are gusty. DO NOT apply when wind speed is greater than 16 km/h at flying height at the site of application. DO NOT apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE) [fine/medium/coarse] classification. To reduce drift caused by turbulent wingtip vortices, the nozzle distribution along the spray boom length **MUST NOT** exceed 65% of the wing- or rotor-span*

# *Buffer Zone Exemptions*

- *Use of the following spray methods or equipment DO NOT require a buffer zone: hand-held or backpack sprayer, spot treatment, inter-row hooded sprayer, soil drench and soil incorporation*
- **Terrestrial buffer zones for:**
  - **Forestry - conifer release, site preparation**

# *Buffer Zone Exemptions*

- *Buffer zones for the protection of terrestrial habitats are not required for use on rights-of-way including railroad ballast, rail and hydro rights-of-way, utility easements, roads, and training grounds and firing ranges on military bases*

# *Buffer Zone Exemptions*

- *For application to **rights-of-way**, buffer zones for protection of sensitive terrestrial habitats are not required; however, the best available application strategies which minimize off-site drift, including meteorological conditions (e.g., wind direction, low wind speed) and spray equipment (e.g., coarse droplet sizes, minimizing height above canopy), should be used. Applicators must, however, observe the specified buffer zones for protection of sensitive aquatic habitats*

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# *Current Buffer Zone Approach*

- **Conservative**
- **No flexibility based on:**
  - **Adjacent sensitive habitat**
  - **Application conditions**
- **Doesn't 'credit' drift reducing technologies**

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# Agricultural Buffer Zone Modification Strategy

- **Application Specific Buffer Zones**
  - Provide flexibility
  - Recognize different habitats
  - Reward efficient application
  - Remain environmentally protective

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# Agricultural Buffer Zone Modification Strategy

- Buffer zone reduction factors (modifiers, multipliers)
- Applicator-adjusted buffer zones based on:
  - Sensitive habitat impacted
  - Application variables
    - Meteorology
    - Equipment
- Product - and application - specific buffer zones

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# *Application Variables*

- Droplet size
- Wind speed
- Atmospheric stability
- Discharge height and direction
- Temperature and relative humidity
- Travel speed
- Shrouds and cones
- Adjuvants
- Crop canopy

# *Application Variables*

- **Variable chose:**
  - **Largest effect on drift**
  - **More easily implemented**
  - **Safety to applicator**

# *Field Application Variables*

- **Boom height**
  - Low - High (60 cm)
- **Spray quality (DSD)**
  - Fine - Medium - Coarse
- **Wind speed**
  - 3 Categories
- **Shrouds and cones**

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# Low Boom Application Modifiers

Label Spray Advisory – Fine			
Wind Speed (km/h)	Spray Quality		
	Fine	Medium	Coarse
1-8	0.5	0.1	0.1
9-16	0.7	0.4	0.2
17-25	1.0	0.6	0.4
Label Spray Advisory – Medium			
Wind Speed (km/h)	Spray Quality		
	Fine	Medium	Coarse
1-8	0.8	0.2	0.1
9-16		0.6	0.3
17-25		1.0	0.6
Label Spray Advisory – Coarse			
Wind Speed (km/h)	Spray Quality		
	Fine	Medium	Coarse
1-8		0.4	0.1
9-16		0.9	0.5
17-25			1.0

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# *Modifications*

- Field sprayer application:
  - *Spray boom fitted with a full shield (**shroud**, **curtain**) that extends to the crop canopy, the labelled buffer zone can be reduced by **70%***
  - *Spray boom where individual nozzles are fitted with **cone**-shaped shields that are no more than 30 cm above the crop canopy, the labelled buffer zone can be reduced by **30%***

# *Comments on PMRA BZ Strategy*

- **Comments received from**
  - **Registrants**
  - **Grower groups**
  - **Applicators**
  - **Provincial departments**
- **Over 100 unique comments**

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# *Comments on PMRA BZ Strategy*

- **Risk Assessment**
  - General - 6
  - Habitats - 10
- **Buffer Zones**
  - General - 17
  - Barriers to crop protection - 6
  - Human habitation – 5
  - Exclusions - 18

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# *Comments on PMRA BZ Strategy*

- **BZ Modification Strategy**
  - General - 17
  - Modifiers - 17
  - Complexity - 9
  - Wind speed - 10
  - Training - 6
  - Record keeping - 6
  - Water multipliers - 5
  - BMP booklet - 5
  - Implementation - 4

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# *Comments on PMRA BZ Strategy*

## *General*

- Why are buffer zones required?
- Buffer zones should be reflective of the real world; buffer zones are too conservative
- Buffer zones should be guidelines not a label requirement
- Not harmonized with US approach

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# *Comments on PMRA BZ Strategy*

## *Sensitive Habitats*

- Definitions of sensitive habitats too broad
- Buffer zone may not be applicable due to absence of most sensitive species
- Ten crop terrestrial species used to calculate buffer zones should be replaced by indigenous species
- Sensitive habitats are sources of pest inoculum, e.g. invasive species

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# *Comments on PMRA BZ Strategy*

## *Barriers to Crop Production*

- Sensitive habitats may be barriers to farming and may be removed
- Farmers should manage sensitive habitats on a case-by-case basis
- Buffer zones result in loss of cultivable land or non-treated areas
- Buffer zones prevent use of perimeter sprays (IPM)

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# *Comments on PMRA BZ Strategy*

## *Exclusions*

- Artificial ponds
- Self-contained water bodies
- Windbreaks
- Wetlands created by landowners
- Terrestrial areas planted by farmers
- Should exclude vegetation planted:
  - to protect sensitive aquatic areas
  - to reduce off-site drift

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# *Comments on PMRA BZ Strategy Modifiers*

- **Need modifiers for:**
  - drift reduction agents
  - low drift nozzles
  - air assist nozzles
  - boom height
  - stage of crop growth
- **Should consider temperature and humidity as modification factors for aerial application**

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# *Comments on PMRA BZ Strategy*

## *Complexity*

- Strategy is complex and restrictive and time consuming
- Numerous calculations must be carried out and for each application
- Complex calculations, should develop software program
- Should use The Netherlands approach as starting point as it is simpler

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# *Comments on PMRA BZ Strategy*

## *Training*

- Education and training is important and should be undertaken before the proposal is implemented
- PMRA should produce training tools
- PMRA regional officers should train key stakeholders
- Agricultural stakeholders should deliver training
- Current training material out of date
- Speed at which training material can be updated may be problematic

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# *Comments on PMRA BZ Strategy*

## *BMP Booklet*

- Should include graphical information on how to measure buffer zone
- Should have a detailed list, including pictures, of sensitive habitats
- Supportive of updating guidance booklet as new technology developed
- Detailed guidance in BMP for measuring wind speed
- Guidance document needs to be simple and easy to use for farmers

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# *Sensitive Habitat*

- Area containing /comprised of organisms affected by pesticide
- Aquatic – permanent or seasonal
  - temporary not considered sensitive
- Terrestrial

# *Sensitive Habitat*

- Sensitive terrestrial habitats:
  - *grasslands, forested areas, shelter belts, woodlots, hedgerows, riparian areas and shrublands*
- Sensitive aquatic habitats:
  - *lakes, rivers, sloughs, ponds, prairie potholes, creeks, marshes, streams, reservoirs, wetlands and estuarine /marine habitats*

# *Non-Habitat Area*

- **Cropland, pasture, rangeland, areas adjacent to right of way**
- **Ditch**
- **Managed area ?**

# *Terrestrial Habitats*

## *Issues*

- **Buffer zones too large**
  - Can be larger than field
- **Loss of treated acreage**
  - **Solution - elimination of habitats by growers**
    - Shelterbelts
- **In-field “habitats” – how do you buffer?**

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# *Terrestrial Habitats*

## *Issues*

- Invasive weeds – adjacent to treated fields
  - Do BZs apply in all situations?
    - Federal vs Provincial jurisdictions
  - Do BZs cause damage in long-term?
- What are we really trying to protect?

# *Terrestrial Habitats Considerations*

- **Current risk assessment:**
  - Based on 10 crop plants
  - Juvenile plants
  - Non-lethal measurement endpoint
    - Dry wt., shoot height
  - EC<sub>25</sub>
  - Based on potential for recovery at later stages of growth
  - Most sensitive species

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# *Terrestrial Habitats Considerations*

- **Modify the risk assessment?**
- **Registrants claim crops are nearly always more sensitive than weeds**
  - **Where are the data?**
- **OECD Annex 3 list of non-crop species**
  - **52 non-crop**

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# *Terrestrial Habitats Considerations*

- Effects on fully-grown plants
- Species sensitivity distribution
  - $HD_5$  of  $LC_{50}$
- Native species vs Non-native species (invasive)
  - Ecological function?

# *Terrestrial Habitats*

## *Considerations*

- **Ecological basis for size of habitats**
  - **Areas <1-2 ha – may not be highly functional for wildlife**

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# *Habitats*

- **Workshop on Identification of Sensitive Habitats**
  - April 2008
  - Fall 2008
- **Assist PMRA in identifying habitats which should be protected**

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