



# Economic and Related Benefits of Phenoxy Herbicides to Canadian Farmers

Alberta Barley Commission ~ FarmTech 2007

Industry Research Task Forces for  
MCPA, Mecoprop-p & 2,4-D

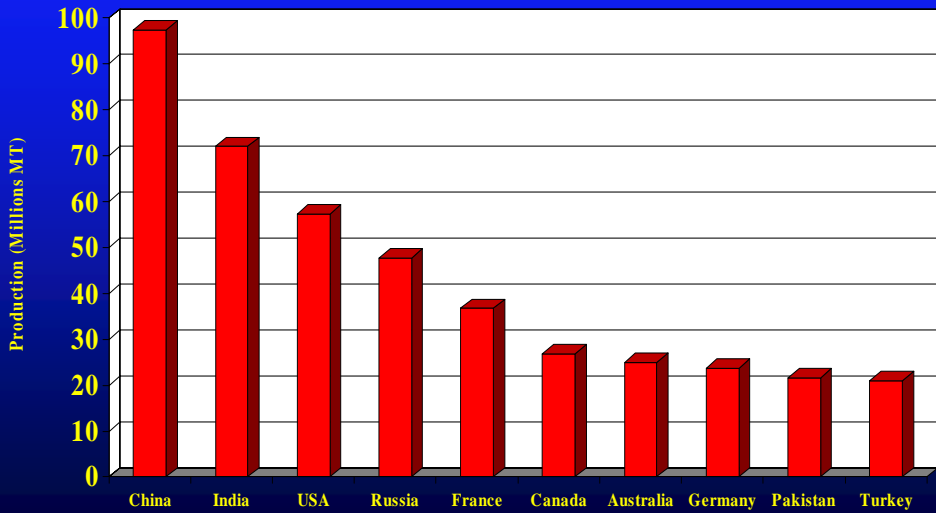
January 25, 2007

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## Canada Herbicide Value Study

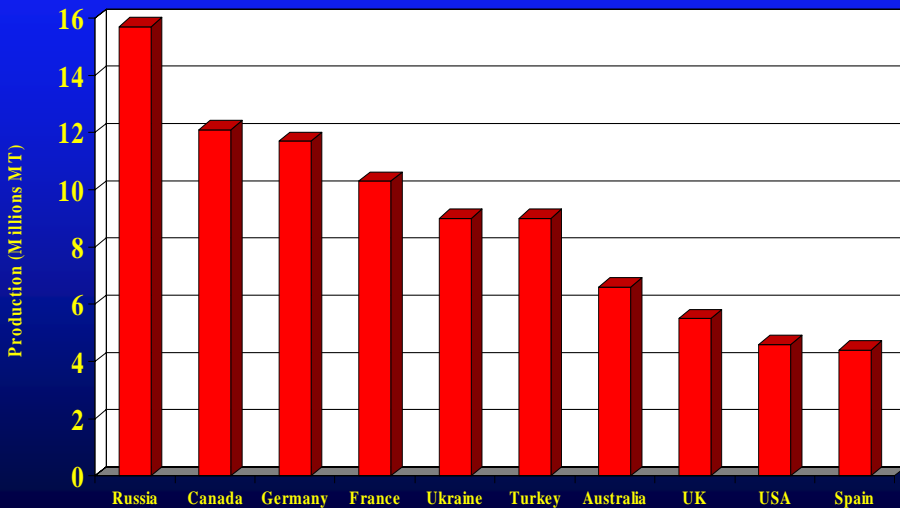
- **Three Major Phenoxy Task Forces**
  - 2,4-D Task Force
  - MCPA Task Force Three
  - MCPP-p Task Force (mecoprop-p)
- Research task forces established by pesticide registrants to jointly fund Good Laboratory Practice (“GLP”) research required by regulatory agencies for the re-evaluation of older compounds that are sold by many companies.

## World Wheat Production – 2005



Source: Food and Agriculture Organization

## World Barley Production – 2005



Source: Food and Agriculture Organization

## Canada Herbicide Value Study

- Objectives of Study
  - Identify and quantify values/benefits (added costs) if phenoxies were not available for use in Canada
- Focus of Study Tasks
  - Barley and wheat markets in Alberta, Saskatchewan, Manitoba and Ontario
  - Managing weed resistance to herbicides
  - Non-crop industrial sector
  - Lawn and turf sector

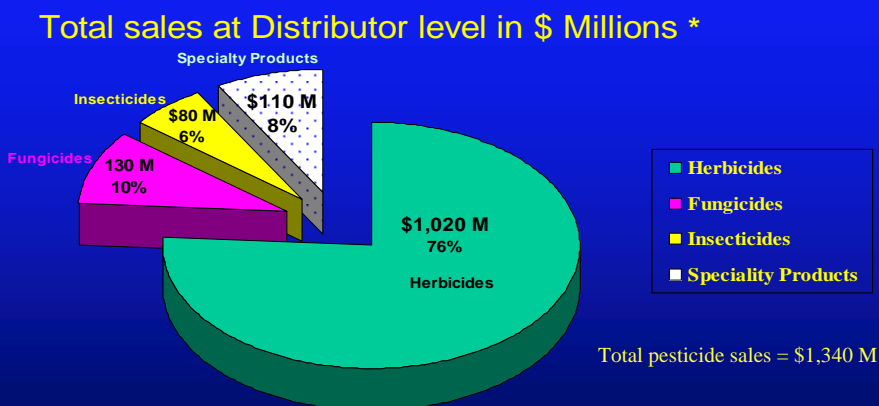
## Why are Phenoxies Important?

- A common tool for control of weeds in cereals, non-crop and turf for nearly 60 years.
- Low cost crop input – very important with today's "ethanol economy".
- Widely used for the control of noxious and allergen producing weeds.
- Used to control weed and brush growth on industrial sites and railway right-of-ways.
- Important in the ongoing battle against weed resistance.
- New uses continue to be identified.
- Trusted to do the job.

## Canada Herbicide Value Study

- Phenoxy Herbicide Use
  - 2,4-D and MCPA account for most phenoxy herbicide expenditures in agriculture sector
  - 2,4-D and MCPP-p account for most phenoxy herbicide expenditures in the lawn & turf sector
    - 2,4-D and mecoprop-p are used in over 95% of turf herbicide products available
  - 2,4-D alone or 2,4-D and non-phenoxy herbicides account for most herbicide expenditures in non-crop sector

## Canada Annual Pesticide Sales



\* Western Canada accounts for 75% of pesticide sales

Source: CropLife Canada 2004/2005

## Study Methodology

- Bottom-up, market data approach.
  - Market research
  - Customer surveys
  - Hard market data from the agriculture sector
- Very conservative assumptions. For example:
  - very limited decrease in yield considered
  - no decrease in grain quality
  - no change in costs of remaining herbicides for alternative treatments
- Expert peer review by well-respected, independent economist.

## Example of Alternative Herbicide Treatment

**Table 5.5: Example of Alternative Treatments to the Use of 2,4-D Alone on Wheat**

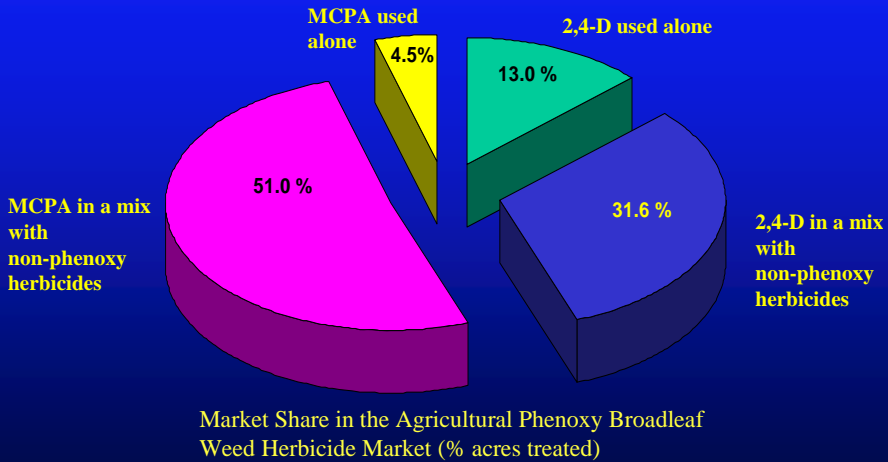
| Alternatives     | % of Treatment Area* | Average Cost per Acre <sup>9</sup> (\$/acre) | Incremental Cost (+/- \$/acre) | Other Cost Impacts <sup>10</sup> (\$ millions) | Total Cost Impact (\$ millions)** |
|------------------|----------------------|--|--------------------------------|--|-----------------------------------|
| MCPA alone       | 5                    | 3.42   | 1.20                           | -  | 0.15                              |
| Express          | 5                    | 4.31   | 2.09                           | -  | 0.26                              |
| Refine Extra     | 10                   | 4.39   | 2.17                           | -  | 0.54                              |
| Buctril/Mextril  | 20                   | 5.97   | 3.75                           | -  | 1.86                              |
| Banvel           | 5                    | 3.05   | 0.83                           | -  | 0.10                              |
| Dyvel            | 15                   | 5.20   | 2.98                           | -  | 1.11                              |
| Target/Tracker   | 10                   | 5.84   | 3.62                           | -  | 0.90                              |
| Frontline        | 10                   | 6.72   | 4.50                           | -  | 1.11                              |
| Brigade          | 10                   | 22.00  | 19.78                          | -  | 4.90                              |
| Trophy           | 5                    | 10.12  | 7.90                           | -  | 0.98                              |
| Baseline         | 5                    | 22.50  | 20.28                          | -  | 2.51                              |
| Additional costs |                      |  |                                | 8.20   | 8.20                              |
| Total            | 100                  | 8.04   |                                |  | 22.62                             |

Notes:

\* Based on 2.48 million acres treated with 2,4-D alone.

\*\* Total cost impact is calculated as the % of treatment area for the alternative treatment x acres treated with 2,4-D alone x incremental cost of the alternative treatment (e.g., for the MCPA alone alternative, 5% x 2.48 x \$1.20 = \$0.149M).

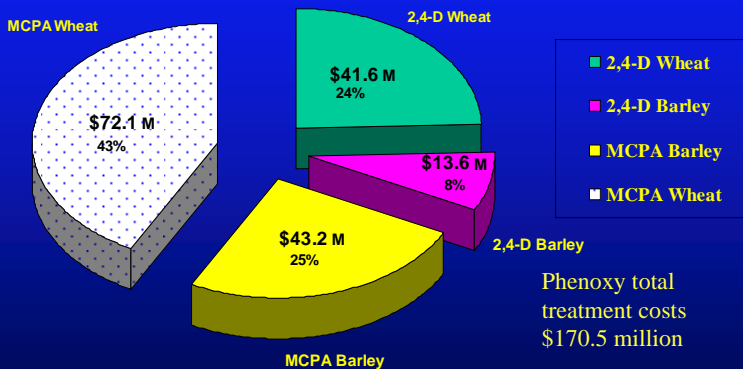
# Canadian Phenoxy Acreage in Wheat & Barley



Source: Major suppliers and data bases

# Phenoxy Treatment Costs in Canada

## Current Treatment Costs (\$ Millions) \*



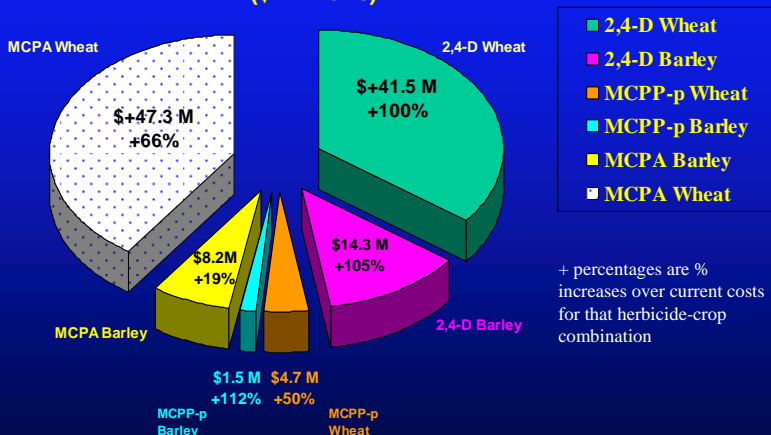
\* MCPP-p is included in 2,4-D and MCPA as mixtures

# Major Findings – Ag Sector

- Of the 34.7 million acres of wheat and barley in Western Canada, over 90% were treated one or more times with herbicides in 2005.
- Also in 2005, over 80% of “brand acres” in Western Canada were treated with a phenoxy herbicides:
  - 2,4-D (32%)
  - MCPA (44%)
  - mecoprop-p (4.3%)
- Total current phenoxy herbicide costs to wheat and barley producers are estimated at \$170.5 million; \$55 million for 2,4-D and \$115 million for MCPA (MCP-p included in above costs).

## Phenoxyes Removed – Additional Cost

Estimated additional Costs for Broadleaf Weed Control  
(\$ Millions) \*



\* If all three phenoxyes are removed – increased costs \$224 M / + 131%

## Major Findings – Ag Sector

- If all three phenoxy herbicides were removed from the Canadian market, additional weed control costs would amount to \$224 million as producers turned to more expensive, less effective herbicides.
- Revenue losses from yield decreases approximately \$114 million:
  - Study assumes reduction in Canadian yield would have no effect on market prices.
- Total loss to producers:  $\$224 \text{ M} + \$114 \text{ M} = \$338 \text{ million}$ .
- Total burden to wheat and barley produces:  
 $\$170 \text{ M}$  (existing costs) +  $\$338 \text{ M}$  (additional costs) =  $\$508 \text{ million}$ :
  - 3 times current costs.
- The loss of a valuable tool in combating weed resistance not calculated. The value of phenoxy herbicides to Canadian farmers might be greatest in this area.

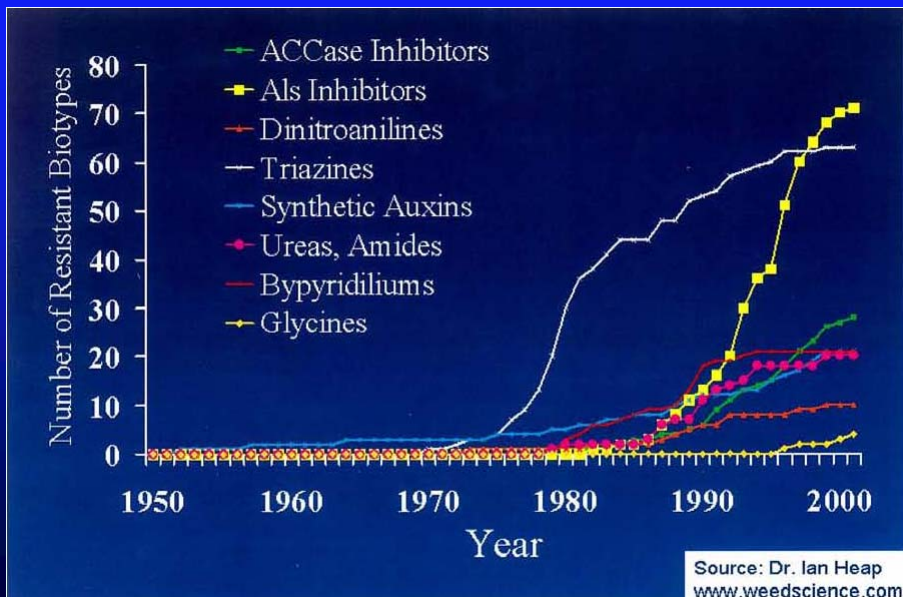
## Lawn and Turf Sector

- **Conclusions for Turf Value**
  - Currently: \$ 3.2 million annual cost for use of herbicides for weed control
  - There are no herbicide alternatives available (registered) to the lawn/turf sector if phenoxyes are withdrawn.
  - \$ 26.4 million annual cost without herbicides:  
an increase of > 8X
  - 7.7% premium to a home's mean value for a well maintained lawn (range of 4 to 15% increased value) (trees added more)

## Non – Crop Industrial Sector (IVM)

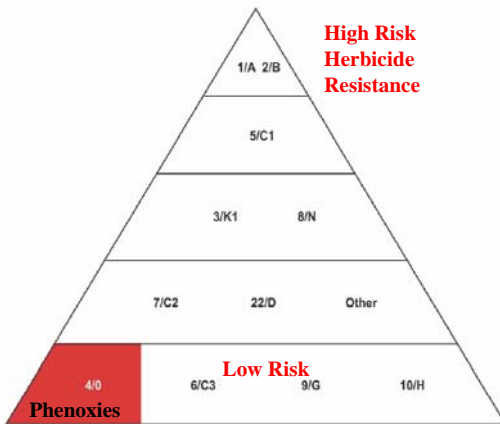
- Estimated costs of Industrial Vegetation Management (IVM) if 2,4-D were not available:
  - Current \$50 million total annual IVM costs:
    - \$30 million mechanical cutting and services
    - \$20 million annual herbicide product costs; of which \$7 million 2,4-D sales and application
  - \$17.5 million additional costs – 150% increase, if 2,4-D not available

## Chronological Increase in Weed Resistance



# Managing Resistance to Herbicides

Figure 6.1: The Risk of Target - Site Resistance for Herbicide Groups  
(taken from Beckie, 2006)



Classification of herbicide site of action by risk of selection for target-site resistance (high  $\leq$  10; moderate = 11-20; low  $>$  20 applications (H. Beckie and L. Hall, unpublished data); "Other": insufficient information to definitively categorize as low or moderate risk. Numerical (Weed Science Society of America) and alphabetical (Herbicide Resistance Action Committee) herbicide groups are referenced in (Beckie, 2006). The phenoxy herbicides are at point 4/O, highlighted.

- The report does not estimate the economic significance of phenoxies to prevent and delay emergence of resistance.
- However, phenoxy value could overshadow all other economic benefits identified in the report.
- “Phenoxies, and especially 2,4-D, are critical for proactive and reactive broadleaf weed resistance management.”  
Beckie, 2006

## Unknown Value, Immeasurable Benefit

### Managing Weed Resistance:

- Over 60 years 2,4-D has proven to be one of the herbicides with the lowest risk of fostering the development of weed resistance.
- What is the value of this critical characteristic in today's agriculture?
- Priceless.

# Agriculture Sector Summary

- How will wheat and barley producers maintain yield and quality if the phenoxy herbicides are withdrawn?
  - Cultivate more land along with other more expensive herbicides to maintain quality and yield (not practical in most cases).
  - More summer fallow and other tillage (perhaps, but how practical given trends to no-till)
  - Other weed management practices, including higher cost herbicides, to maintain the same crop quality and yield, if feasible and affordable.
- Phenoxy herbicides are an important low cost crop input saving Canadian farmers some \$224 million per year.
- Low cost crop inputs are even more important in the “ethanol economy”.
- For 60 years, this class of herbicides has been a trusted tool for Canadian farmers – let’s keep it in the tool box.

## Economic and Related Benefits of Phenoxy Herbicides to Canadian Farmers

Questions?

Full report available at:

[www.24d.org](http://www.24d.org)

Summary brochures also available