


Treated seed regulations in Québec

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State of VERMONT, House of representatives
Committee on Agriculture, Food Resiliency, and Forestry

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*« Good science starts with good **problem definition**, and good problem definition usually starts with accurate **observations on the system in question** »*

Lowenberg-DeBoer, James, et Erickson, Bruce. 2019. Setting the record straight on precision agriculture adoption. *Agron. J.* 111: 1552-1569.

*« It is **difficult** to get a man to understand something when his salary depends upon his **not understanding it** »*

Upton Sinclair (1878-1968)



Vidéo « DDT so safe you
can eat it, 1947

<https://www.youtube.com/watch?v=gtcXXbuR244>

Defensor de los OGM

Patrick Moore

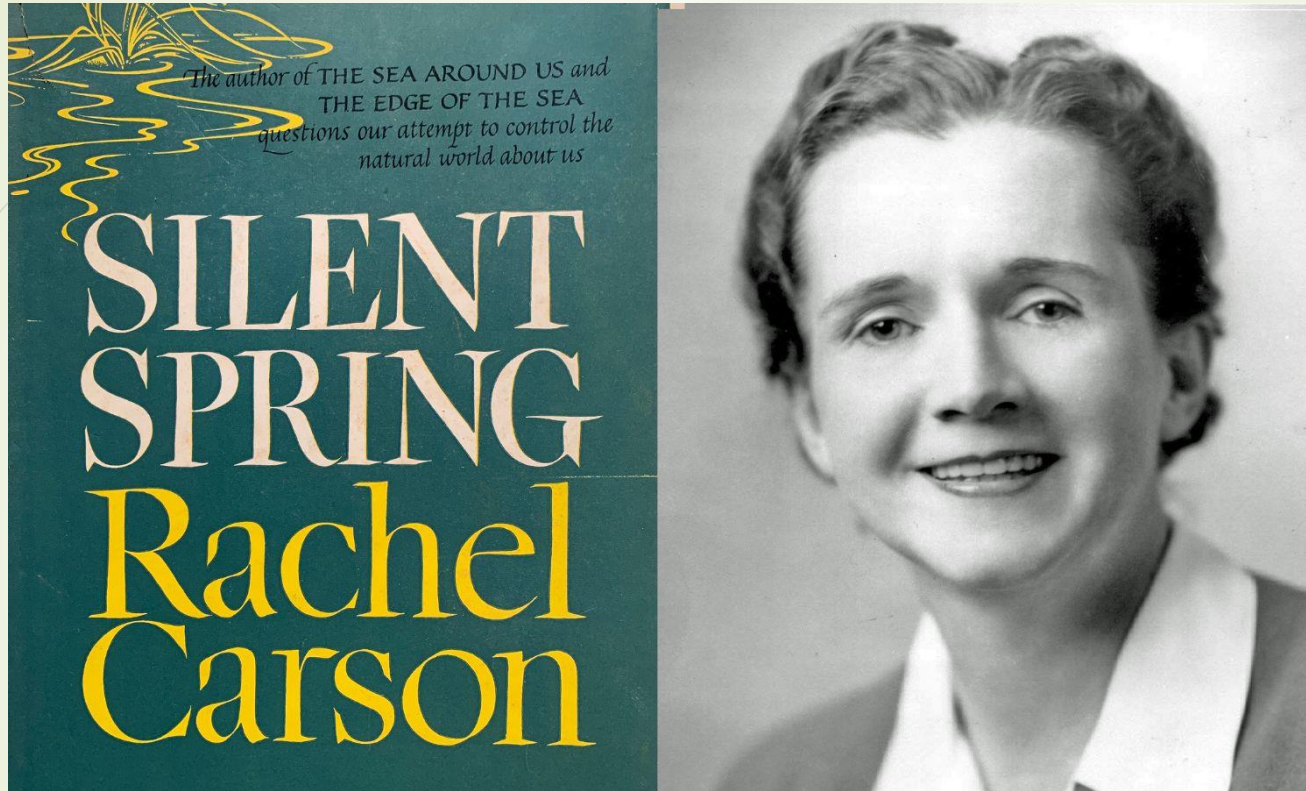
CO
LE

2014
TF1
LIVE

- Alors vous êtes prêt
à se boire en verre ?
Entonces usted está listo
para beber una copa?

March 2015, TF1 (french television)

<https://www.youtube.com/watch?v=7jWyrbPOTJQ>



- In 1962: Abundant scientific evidence of global disaster already brought about by first uses of pesticides
- 1962-2024: any progress ?



The backdrop

- ▶ Québec: around 1 M acres each of corn, soybeans; 600 000 acres in small grains; 100 000 acres in vegetables;
- ▶ Total pesticides used: over 5 000 tons of active ingredients, 74 % in the ag sector;
- ▶ In 1992, the Ministry of Agriculture, **together with the Ministry of Environment and the farmers union** agreed upon a plan aiming at a reduction of 50 % of the amount of pesticides used by 2000: no effect;
- ▶ The plan (voluntary) was resurrected, with lesser, more humble objectives, in 2011 and again in 2020: no effect;
- ▶ Conclusion: incentives and extension don't work (but no one ever wondered why).



Figure 1. Évolution des ventes totales depuis 1992

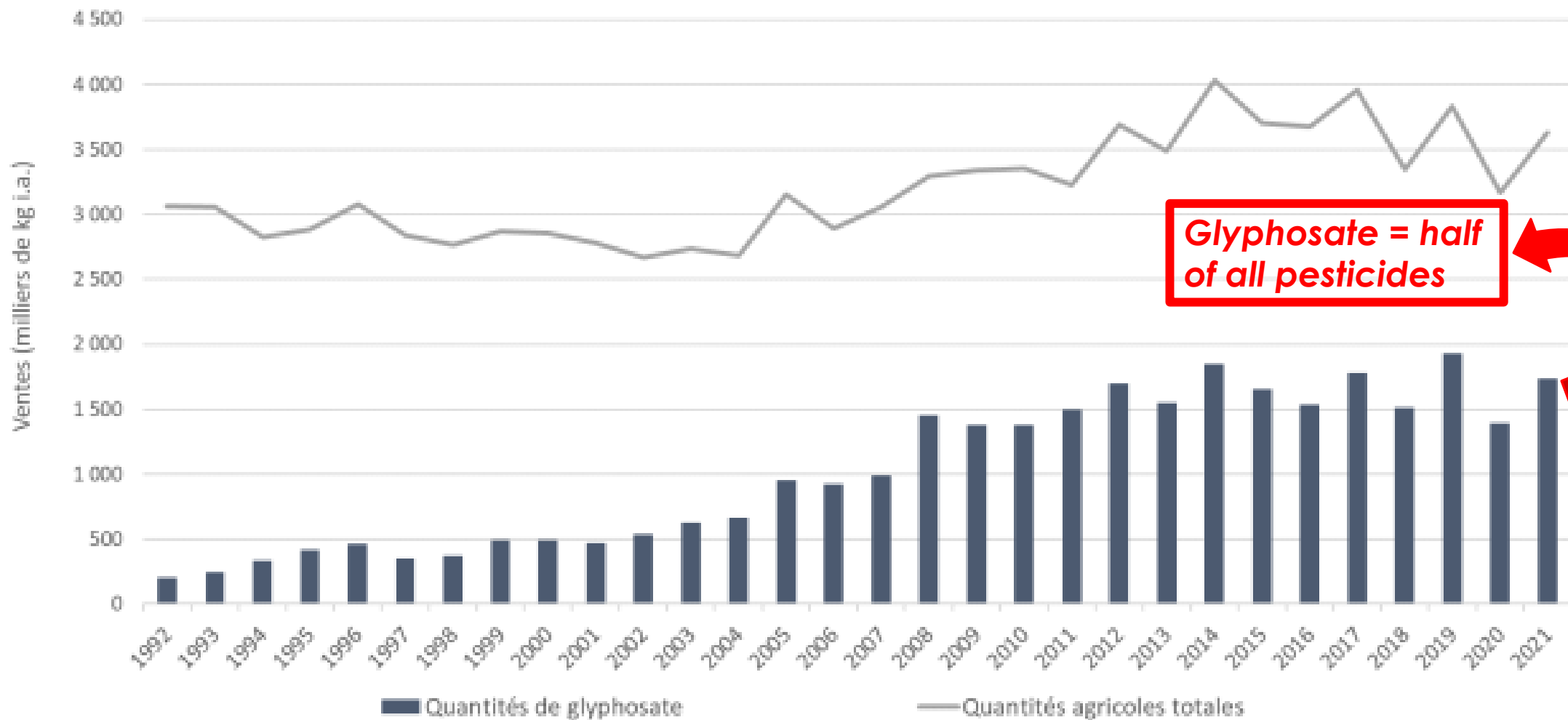


Figure 3. Variation annuelle des ventes de glyphosate du secteur de la production végétale depuis 1992



In the meantime...

- Monitoring by the Ministry of environment reported that pesticides were detected in most if not all streams, and in increasing concentrations, especially neonics;
- Scientific evidence of their toxicity built stronger. For ex., Bonmatin (2010): toxicity of neonics for honeybee = 5400 à 7297 X that of DDT;
- Neonics suspected to be a major cause of colony collapse disorder (CCD) and pollinators decline
- Public concern grew stronger: environment, public health, etc.
- Public-funded research showed no benefit to farmers from the use of insecticide-coated seed in 84 field crops trials (Labrie et al., 2020)

RESEARCH ARTICLE

Impacts of neonicotinoid seed treatments on soil-dwelling pest populations and agronomic parameters in corn and soybean in Quebec (Canada)

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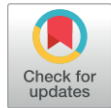
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Abstract

Agricultural soil pests, including wireworms (Coleoptera: Elateridae), are managed primarily with pesticides applied directly to seeds before sowing. Seeds coated with neonicotinoids have been used widely in Quebec (Canada) for several years. To assess the agronomic and economic value of neonicotinoid seed treatments in soybeans and corn in Quebec, trials were conducted from 2012 to 2016 in 84 fields across seven regions in Quebec. We evaluated the effect of neonicotinoid seed treatments on soil pest densities, crop damage and yield. The results showed that 92.6% of corn fields and 69.0% of soybean fields had less than 1 wireworm per bait trap. However, no significant differences in plant stand or yield were observed between treated and untreated corn or soybeans during the study. This study shows that neonicotinoid seed treatments in field crops in Quebec are useful in less than 5% of cases, given the very low level of pest-associated pressure and damage, and that they should not be used prophylactically. Integrated pest management (IPM) strategies need to be developed for soil insect pests to offer effective alternative solutions to producers.

Introduction

Since the middle of the 1990s, neonicotinoids (i.e. imidacloprid, clothianidin and thiamethoxam) have become the main class of insecticides routinely used to protect seeds and seedlings against injuries caused by soil insects [1, 2, 3]. Corn, canola, soybeans, wheat and cotton are the principal crops grown worldwide for which seed treatments are used on a large scale, with a rapid increase in the acreages treated [1, 4]. A vast body of scientific literature has demonstrated that the scale of use of those insecticides has resulted in widespread contamination of agricultural soils, freshwater resources, wetlands, and non-target vegetation, along with

Materials and methods

- 5 years, 7 régions, 84 site-years
- Sites prone to damages were picked 1/3
- Each site treated as an independant trial
- The sole factor: wi/wo NST, 3 reps

Results

- Wireworms and seed corn maggot were present in all fields, sometimes in large numbers
- No effect of NST on insect no.
- Sometimes NST reduced no. of damaged seedlings
- No effect on plant stands nor yields (0/84)
- Conclusion holds true for all seed insecticides

Industry/UPA interference

- Hindered the publication of results
- Had me fired from the Dept of Ag
- Entertained the doubt on risk (5 %)

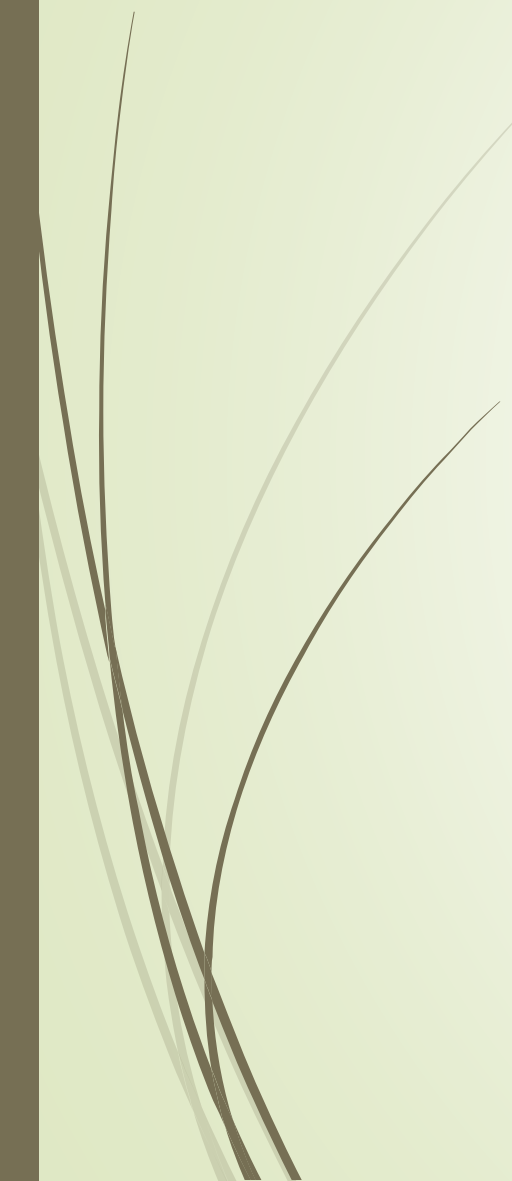
Ministry of Environment 2019: 5 « High-risk pesticides »

Require recommendation by a registered agronomist

Active ingredient	Type	Crops	% Reduction since 2015	Remarks
Atrazine	Herbicide	Field crops	90	Persistent in the environment
Chlorpyrifos	Insecticide	Vegetables	99	Unlawful in Canada by the end of 2023
Clothianidin	Neonicotinoids (Insecticides)	All	99	As of 2015, 100 % of the corn planted, 50 % of the soybeans were treated with NST; in 2021, 0,5 %.
Imidacloprid				
Thiamethoxam				



Impacts on crops and farmers

- No crop failures have been reported;
 - No impact on yield either, although some cases were brought up, but after a closer look by the agronomists, there were no cases of damages to seedling, stand (population of plants/acre) or yield that could be traced back to the absence on NST;
 - A rapidly growing number of farmers are using insecticide-free seed (just fungicides) and again no negative impacts are reported;
 - Spring 2024: between 30 and 40 % of the seed sales were without insecticides;
 - Can be linked to: pressure coming from all around and evidence of no harm being done (> 1000 trials);
- 



The shortcomings

- Instant switch to other insecticides, i.e. diamides, despite evidence of their uselessness;
- Diamides soon detected in most water ways of the corn growing areas;
- Proven to be less toxic to honeybees, but more to butterflies and aquatic life;
- Sales of pesticides keep up, loss of trust, public outcry;
- Alternative methods, i.e. Integrated pest management (crop rotation, etc.), are overlooked;
- June 2023: the Minister of Environment requests a modification to the Pesticide code (Code de gestion des pesticides) to require verification of need for all seed insecticides and fungicides to protect water and bees;
- How come we must turn to legislation even when such toxic compounds show no benefit to farmers ? Industry and Farmers organization interference, too few extension agronomists.



Conclusion

- Legislation has limitations;
- The adoption of basic agronomic research results – IPM - could bring about a short term reduction of more than 50 % in the use of pesticides;
- But unless the QC extension system undergoes major adjustments, we will keep relying on legislation;
- The « Justification of need » requirement extended to all seed insecticide in 2025; projection: all seed pesticides in the near future
- ***Questions ?***