



# **An Assessment of the Costs to Ontarians of Proposed Amendments to Ontario Regulation 63/09 under the Pesticides Act**

Prepared for:  
CropLife Canada

May 8, 2015

## Summary of Key Findings

This report estimates the costs to comply with the Proposed Amendments to Ontario Regulation 63/09 under the Pesticides Act, using internationally accepted approaches to standard cost modeling (SCM) and sound regulatory impact analysis (RIA). Below is a summary of key findings:

### Costs to Comply with the Proposed Regulations

- Costs for Ontario farmers to comply with the proposed regulations are estimated to be over \$24 million per year.
- In addition, it is estimated that the proposed regulations will reduce incomes for corn and soybean farmers in Ontario by over \$880 million per year.
- Corn production is expected to fall by over 2.6 million tonnes per year, and soybean production by over 1 million tonnes per year.
- When costs to seed vendors, seed sales representatives and professional pest advisors are included, the costs to all businesses in Ontario to comply with the proposed regulations are estimated to be over \$26 million per year.

### Total Costs of the Proposed Regulations

- When the full implications of the proposed regulations are evaluated, including impacts on yields, production and farm income, the proposed regulations are expected to reduce GDP in the corn and soybean sector by \$345 million per year, and inflict further reductions in GDP on the Ontario economy of over \$265 million per year.
- In total, the regulations are expected to cost Ontarians about \$660 million per year.

### Other Key Findings

- Professional agrologists find that the field testing requirements prescribed by the regulation are unworkable, and will not yield reliable estimates of the threat of pests to corn and soybean production in Ontario.
- The design of the proposed regulation indicates that the government of Ontario has determined that yield losses of over 10% for corn and soybean farmers is an acceptable outcome.
- Incremental benefits of the proposed regulations cannot be estimated, because there is no evidence to indicate that there would be any benefits beyond those that are being achieved through other collaborative efforts by stakeholders.

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## 1. Purpose

This report estimates the costs that would be imposed on business entities to comply with the Proposed Amendments to Ontario Regulation 63/09 under the Pesticides Act. The report also considers the overall costs and benefits of the proposed regulation to Ontarians.

## 2. Methodology

### 2.1 Estimating Costs to Business

The costs to comply with regulations fall into three general categories:

**Administrative Costs:** Administrative costs, often referred to as “paperwork burden” or “red tape”, represent time spent meeting information obligations of regulations. Internal staff or external staff may be employed to meet these requirements. Examples include learning about regulations, applications for subsidies or grants, notifications to the regulatory authority, completing reports, maintaining records, cooperating with audits/inspections.

**Upfront Costs:** Upfront or one-off costs are the direct costs incurred as a result of stakeholders complying with regulatory requirements. These can include both operating and capital costs, such as capital expenditures, purchasing new equipment, displaying signs, training staff, new space requirements.

**Ongoing Costs:** Ongoing or recurring costs are costs that external stakeholders continually incur in complying with the regulatory requirements. These ongoing operating costs tend to be spread out over a longer period of time, rather than upfront. Examples include repairs and improvements to equipment, hiring additional labour, periodic inspections.

The compliance costs outlined above are all considered **direct costs**, as they can be traced directly to tangible activities carried out by a business to meet the requirements of a regulation. Estimates of direct costs of compliance of the proposed regulation are summarized in section 3. Direct Costs of Compliance.

**Indirect costs** arise when stakeholders, in response to a regulation, are forced to alter their behaviour in a manner that is less efficient, resulting in higher costs or lower revenue. Indirect costs include opportunity costs, such as the lost production or sales that result when stakeholders divert resources away from business activities and towards regulatory compliance activities. They also include price impacts, which arise when businesses pass on the costs of their regulation through to consumers and other business via higher prices.

## 2.2 Standard Cost Model Analysis

The analysis of direct compliance costs uses a Standard Cost Model (SCM) approach. Governments worldwide have adopted SCM as a best practice for assessing administrative and compliance burden of regulations. The Organization for Economic Cooperation and Development (OECD) has endorsed SCM as an effective approach to assessing regulatory administrative costs.<sup>1</sup> SCM-based approaches have been incorporated into Regulatory Impact Analysis (RIA) requirements in Canada by the federal government, the Government of Alberta, and the Government of Ontario.

In its simplest form, SCM involves estimating regulatory costs for a typical stakeholder, then scaling the costs to the entire stakeholder population according to the following formula:

$$\text{Cost} = \underbrace{\text{quantity} \times \text{price} \times \text{frequency}}_{\text{Cost per stakeholder}} \times \underbrace{\text{stakeholders}}_{\text{Population of affected stakeholders}}$$

Where:

**Quantity** - Units or time required for a specific information obligation or regulatory compliance activity (for example 10 hours of admin staff time).

**Price** -The price per unit or hourly wage rate applied to the quantity.

**Frequency** -The number of times per year that the activity would be undertaken.

**Stakeholders** -The population of stakeholders impacted by the regulatory requirements.

## 2.3 Identification of Regulatory Requirements by Affected Stakeholder

RIAS Inc. reviewed the following documents posted on the Ontario Environmental Registry related to the Regulation Proposal Notice: *Regulatory Amendments to Ontario Regulation 63/09 under the Pesticides Act to Reduce the Use of Neonicotinoid Insecticides* (EBR Registry Number: 012-3733):

- Draft Regulation Amending O. Reg. 63/09
- Illustrative Example of Proposed Changes Incorporated into Existing O.Reg. 63/09
- Conducting a Pest Assessment: Class 12 Pesticides
- Summary of New Regulatory Requirements to Protect Pollinators.

<sup>1</sup> The OECD was instrumental in development of the SCM and provides access to the *International Standard Cost Model Manual* at <http://www.oecd.org/regreform/regulatory-policy/34227698.pdf>.

From these sources, each regulatory requirement by affected stakeholder group was identified. In consultation with representatives from the stakeholder groups (seed vendors, agrologists and other industry experts), descriptions of the activities/costs to comply with each requirement were developed. The tables below summarize the output from this exercise for each affected stakeholder group:

**Table 1: Seed Vendors**

	<b>Regulatory Requirement</b>	<b>Description of compliance activities/costs</b>
1	Learning about regulatory requirements	Time to review regulations and develop compliance plan
2	A person who sells, offers to sell or transfers a Class 12 pesticide will need to obtain a new licence to sell Class 12 pesticides , with renewal every 5 years	Apply for vendor licence for pesticide sales, send to MOECC by mail only, and pay fee (\$200)
3	A person who sells, offers to sell or transfers a Class 12 pesticide will need to get IPM training, with renewal every 5 years	Time and cost for IPM course (based on Grower Pesticide Safety Course, cost of \$105 and full day)
4	A Treated Seed Vendor must disclose in all advertising whether corn and soybean seeds being sold are Class 12 pesticides and whether they contain imidacloprid, thiamethoxam or clothianidin	Cost to revise and print Seed Guide publications
5	When a vendor advertises a Class 12 pesticide he or she must also advertise that corn and soybean seeds not treated with neonicotinoid insecticides are available for sale.	Included in row above
6	A vendor is required to verify that a customer purchasing Class 12 pesticides is either trained in integrated pest management or a Treated Seed Vendor.	Time to verify for each sale - capture permit number, field, verify versus sales, IT time on system, field team follow-up and confirmation
7	The vendor must report the sale of Class 12 pesticides and non-treated corn and soybean seeds annually to the Ministry of the Environment and Climate Change.	Time and cost to prepare and send report
8	The vendor must provide the Ministry of the Environment and Climate Change with a list of all Class 12 pesticides that the vendor intends to offer for sale in Ontario on an annual basis.	Time and cost to prepare and send report
9	The vendor must ensure that sales representatives receive necessary training, for example to ensure that sales representatives can identify Class 12 pesticides.	Time to develop training and deliver to sales reps
10	Sales representatives are required to carry company identification provided by a Treated Seed Vendor	Cost of I.D. cards

**Table 2: Seed Sales Representatives**

	<b>Regulatory Requirement</b>	<b>Description of compliance activities/costs</b>
1	Learning about regulatory requirements	Time to review regulations
2	Sales representatives must complete any training for seed dealer representatives that is provided by the treated seed vendor.	Time for training
3	Sales representatives must provide, to the vendor, copies of documentation required to be provided	Collect declarations and reports, provide to vendor

by purchasers of Class 12 pesticides.

4 Sales representatives must keep copies of the written and IPM declaration and pest assessment reports for at least four years.	Storage space (assume equivalent to \$200 cost of filing cabinet for each rep) and 15 minutes per sale transaction for reps to process/manage documents
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**Table 3: Professional Pest Advisors**

Regulatory Requirement	Description of compliance activities/costs
1 Learning about regulatory requirements	Time to review regulations and Pest Assessment Guidelines
2 A person certified as a Certified Crop Advisor (CCA) by the Ontario Certified Crop Advisor Association, a person certified as a Certified Professional Agronomist (CPAg) by the American Society of Agronomy, a person registered as a member under the Ontario Institute of Professional Agrologists or a person that the Ministry of the Environment of Climate Change deems to have equivalent qualifications.	Are there enough certified advisors to meet the increased need? If not, what would be the additional cost for certification?

**Table 4: Farmers**

Regulatory Requirement	Description of compliance activities/costs
1 Learning about regulatory requirements	Time to review regulations and Pest Assessment Guidelines, and develop compliance plan
2 <u>Integrated Pest Management Training</u> : In order to plant Class 12 pesticides a person must complete a course on the use of Class 12 pesticides. Following successful completion of the course, a certification number will be given. This certification would be valid for five years.	Time (and travel?) for IPM course (based on Grower Pesticide Safety Course, cost of \$105 and full day)
3 <u>Voluntary Reduction Approach</u> : For the 2016 growing season, a person is allowed to purchase and use Class 12 pesticides for up to 50 per cent of the land that will be planted with corn and soybean [percentage of an operation's total land that will be planted with corn or soybean]. A person would be able to purchase Class 12 pesticides by providing a written declaration to the vendor stating that he or she will not purchase more than the maximum allowed under this approach. As an incentive to early reduction, a person using this approach would not be required to do a pest assessment on any of their farmed land	Time to assess needs and prepare declaration.
<b><u>Pest Assessment Report</u></b>	
4 1. Soil Pest Scouting Assessment - A pest assessment can be completed by an IPM trained farmer. After the 2016 growing season, a pest assessment must be completed by a professional pest advisor every <u>three years</u> (phased in over 2017-2020).	Time and cost to prepare assessment

5	2. Crop Damage Pest Assessment - This pest assessment confirms damage to crops from grubs, wireworms, seed corn maggot and corn rootworm in corn. The report from a professional pest advisor must verify that field crop damage was due to grubs, wireworms, and that there was at least a 15 per cent stand loss in corn or 30 per cent stand loss in soybean.	Time and cost to hire a professional pest advisor
6	<u>Compliance with Tag</u> - Use of Class 12 pesticides: - minimize dust emission - use a dust-reducing fluency agent if a seed flow lubricant is being used - avoid equipment maintenance in areas that may affect bee colonies or where bees are foraging	Time and cost for dust deflectors, fluency agent, relocate for maintenance (not estimated, assumed that growers are already complying with PMRA guidance on best practices)

## 2.4 Estimates of Quantity, Price, Frequency and Stakeholder Populations

To complete the SCM analysis of direct costs of compliance, RIAS Inc. prepared estimates of quantity (units), price (unit cost or wage rate) and frequency (# of times per year) for a typical stakeholder to comply with each regulatory requirement according to the SCM model shown in section 2.2, in consultation with industry experts. To scale the results to the full population of affected stakeholders, the following estimates and assumptions were applied in the analysis:

**Table 5: Estimates and Assumptions for Key Variables**

Variable	Estimate/ Assumption	Source/description
<b>Number of Affected Farms</b>		
Micro	4,010	Conference Board, 2014
Small	2,515	Conference Board, 2014
Medium	3,354	Conference Board, 2014
Large	2,245	Conference Board, 2014
Very large	2,194	Conference Board, 2014
Total	14,318	Conference Board, 2014
<b>Acres affected</b>		
Total Seeded Acres (2015)	5,195,000	
Acres for micro sized operations	117,155	Conference Board, 2014
Average farm unit size (parcel, field)	60	Expert agrologist, farmer
# of farm units (parcels, fields)	86,583	Total seeded acres/average farm unit size
# of farm units (parcels, fields) tested - excludes micro-sized operations	84,631	Total seeded acres less acreage for micro-sized operations/average farm unit size
<b>Pest Assessments</b>		
Average # of farm units subject to	83,959	Estimated number of scouting tests required per year,

Soil Pest Scouting Assessment each year		averaged over a 25 year time period, based on RIAS Inc. modeling of the regulatory requirements
Time to prepare pest assessment report using scouting test method (hours)	3	Interviews with expert consultant agrologists not affiliated with seed companies, a number of whom had conducted practices of the proposed test methodology in the field. This estimate is based on time only to conduct the testing and preparing the report, not equipment costs (ATVs, fuel) or travel time.
Average # of farm units that will undergo a Crop Damage Assessment each year	67,142	Estimated number of stand loss tests required per year, averaged over a 25 year time period, based on RIAS Inc. modeling of the regulatory requirements
Time to prepare pest assessment report based on stand loss test method (hours)	1	Assumed to take same time as preparing a report based on scouting test (above)
<b>Number of Vendors and Sales Reps</b>		
Number of seed vendors	900	Seed industry experts
Number of Firms that Produce Seed Guides	30	Seed industry experts
Number of Sales Representatives:	1,200	"Summary of New Regulatory Requirements to Protect Pollinators"
Staff turnover rate	10%	RIAS Inc. estimate
<b>IPM course</b>		
Cost of IPM course	\$105	Assumes same cost as Grower Pesticide Safety Course (\$105)
Length of course (hours)	8	Assumes same time as Grower Pesticide Safety Course ( full day)
<b>Wages</b>		
Farm Operator hourly wage	\$47	Statistics Canada. Table 002-0031 - Distribution of farm families by income group (\$46.12 for Ontario in 2014, inflation adjusted to 2015 values)
Professional Pest Advisor cost	\$100	Interviews with expert consultant agrologists not affiliated with seed companies. Based on hourly charge including agrologist staff time, management overhead. Hourly charges ranged from \$75/hr to \$175 hr. Some estimates were on a per acre basis (approx \$2/acre)
Seed company employee hourly wage (Professional occupations in business and finance)	\$48	Statistics Canada. Table 282-0070 - Labour force survey estimates (LFS) (Ontario full-time of \$35.31 in 2014, inflation adjusted to 2015 values + 35% overhead cost assumed for management, IT, vehicle expenses, office space, benefits, etc.)
Sales representative hourly wage (Wholesale, technical, insurance, real estate sales specialists, and retail, wholesale and grain buyers)	\$36	Statistics Canada. Table 282-0070 - Labour force survey estimates (LFS) (Ontario full-time of \$26.37 in 2014, inflation adjusted to 2015 values + 35% overhead cost assumed for management, IT, vehicle expenses, office space, benefits, etc.)
Administrative support hourly wage (Financial, secretarial and administrative occupations)	\$34	Statistics Canada. Table 282-0070 - Labour force survey estimates (LFS) (Ontario full-time wage of \$205.14 in 2014, inflation adjusted to 2015 values + 35% overhead cost assumed for management, IT, vehicle expenses, office space, benefits, etc.)

## Further Discussion of Key Variables in the Analysis

**Number of Seed Vendors:** The number of seed vendors is an estimate provided by experts in the seed industry. In determining who would be required to comply with the proposed regulations, it is assumed that requirements for “seed vendors” relates to all parties engaged in final sales transactions with farmers for Class 12 pesticides. This includes seed companies (about 30 companies) selling direct to the grower, commissioned sales agents/seed treaters, and farm dealers (farmers who purchase seed from the seed company and re-sell to their farmer customers). In total, these “seed vendors” number approximately 900 in Ontario.

**Number of Farms:** The number of farmers that would have to comply with the regulation is based on Conference Board of Canada estimates from their recent study “The Value of Seed Treatments for Ontario Growers”. Statistics Canada data by farm type shows counts of 4,066 Ontario Corn Farms and 5,250 Ontario Soybean Farms, for total of 9,316, however this is based the farm type classification used by the Census of Agriculture (six-digit codes from the North American Industry Classification System, 2007).<sup>2</sup> Farm type is determined based on 50% of revenues or greater being derived from a particular crop (e.g. corn or soybeans). The number of farmers that plant corn and soybeans in Ontario, and would be subject to the requirements of the regulation, would be higher than the Statistics Canada numbers, so RIAS Inc. used the estimated number of farmers from the Conference Board study.

We believe this is a highly conservative estimate of the number of potentially affected farmers. The Grain Farmers of Ontario estimates that as many as 28,000 thousand farmers could be affected by the regulations based on their check-off database of corn and soybean sales by producer number collected from dealers in a Monthly Report of Fees on Corn/Soybean Purchases.<sup>3</sup>

**Number of Pest Assessments:** RIAS Inc. estimated the number of tests that would take place each year (both scouting tests by farmers and by pest advisors, and stand loss tests by pest advisors) according to the following assumptions:

- All farm units where neonicotinoid treated seed were used in one year would be subject to the scouting test the following year
- All farm units that did not qualify for use of neonicotinoid treated seed based on the scouting test in the spring would be subject to stand loss tests, post-emergence
- All farm units for which a stand loss test was conducted, but did not qualify for use of neonicotinoid treated seed, would then be subject to a scouting test the following spring

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<sup>2</sup> Statistics Canada. Table 004-0200 - Census of Agriculture, farms classified by the North American Industry Classification System (NAICS), CANSIM (database).

<sup>3</sup> See the Grain Farmers of Ontario dealer reporting requirements at <http://www.gfo.ca/Marketing/Dealers.aspx>.

We assume that the bait tests are designed to result in an 80% failure rate (meaning the 80% of the time, the tests would not justify use of neonicotinoid treated seeds).<sup>4</sup> This assumption is based on the government's goal of eliminating 80% of neonicotinoid treated seed use by Ontario corn and soybean farmers. For the stand loss tests, we adopted a failure rate of 99%. This was less of an assumption than a setting in our model. In order to arrive at as close to 20% remaining acres that would be allowed to use neonicotinoid treated seeds based on the 2 sets of tests, we had to set the "pass" rate on the stand loss test to 1%. We note that this appears to be reasonable assumption of the "pass" rate, since the acceptable threshold for stand loss in the test guideline is more than a 15% stand loss for corn and 30% stand loss for soybeans. We discuss the yield loss implications of these stand loss thresholds later in this report.

To reiterate an important point from above, RIAS Inc. modeled the number of tests that may occur each year (conducted by farmers with IPM training or by certified pest advisors) based on our understanding and interpretation of the regulatory proposal, and determined the remaining corn and soybean acres in Ontario that would qualify for use of neonicotinoid treated seeds. **The assumptions we used in our model result in an average of 20.2% of corn and soybean acreage that, based on the assumed pass/failure rates under the prescribed tests, could be planted with neonicotinoid treated seeds each year.** However, this result should not be interpreted by the reader as an indication that RIAS Inc. believes that such reductions in neonic use could ever be achieved in practice. Input from professional agrologists on the time required to conduct the tests, the costs of the tests, concern over the veracity/reliability of the tests, among other factors, strongly indicates that the testing requirements under the proposed regulation are unworkable, as further discussed below.

**Time to Conduct Pest Assessments:** RIAS Inc. conducted interviews with professional agrologists not affiliated with seed companies to estimate the time and cost to conduct pest assessments. In every case, the professional agrologists offered unsolicited views on the tests prescribed in the guideline: *Conducting a Pest Assessment for Class 12 Pesticides*. In summary, professional agrologists interviewed shared the following concerns:

- Bait tests would have to be conducted well into May when wireworms begin to emerge. Specific timing will vary depending on temperature and soil moisture of fields.
- At least 10-12 bait traps will have to be set per field to get results from a minimum of 5 traps due to scavenging of traps by racoons, particularly in fields planted in the previous year with corn. Bait traps will have to be positioned towards the interior of fields to minimize scavenging by racoons.

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<sup>4</sup> This appears to be a reasonable assumption. The government's consultations on their discussion paper "Pollinator Health: A proposal for Enhancing Pollinator Health and Reducing use of Neonicotinoid Pesticides IN Ontario" asked the question "Is the regulatory proposals sufficient to reduce the acreage of neonicotinoid insecticide treated corn and soybean seed by 80 per cent by 2017?" We assume that based on responses to this question, Ontario developed the test protocols to ensure an 80% reduction would be achieved.

- Multiple stand loss tests are likely to be required: post emergence stand loss tests near the end of May for damage due to wireworm, and in mid-late June into July for stand loss damage from rootworm.

Overall, the consensus amongst the professional agrologists interviewed was that the tests prescribed in the guideline will not yield reliable estimates of the threat of pests. Of particular concern was failure of the tests to address the threat of aphid infestation in soybeans, and pest threats to multi-year corn acreages.

Overall, RIAS Inc. estimated the average time to conduct the bait tests to be about 3 hours per field. This estimate is based on a range of responses from professional agrologists, from a low of 2 hours per field for existing clients where the professional agrologist was familiar with the farm, to 4.5 hours per field for new clients.

Estimates of time to conduct stand loss tests ranged from 1 to 3 hours. While the stand loss tests may have to be conducted more than once (as noted above, once in late May to address damage from wireworm and a second time in June/July to assess damage from rootworm), we assumed a conservative average time for stand loss tests of 1 hour.

**Availability of Pest Advisors:** While the costs to prepare pest assessment reports have been estimated, the reality is that there are not enough independent pest advisors available in Ontario to carry-out the work. The proposed regulations require that pest advisors not have any affiliation with seed companies. The number of agrologists that meet that criterion is very limited – estimated to be between 10 and 35 in all of Ontario. RIAS Inc. applied conservative estimates of the amount of hours required by professional pest advisors to do the testing under the proposed regulations, which totaled over 95,000 hours or about 12,000 person days of work. The period of time where the tests could be conducted is only 4-6 weeks in total, meaning that a minimum of more than 280 professional agronomists would be required to complete the work (assuming they work 8 hours a day, 7 days a week over a 6 week period). It is unknown how Ontario farmers are going to be able to secure the services of that many pest advisors to meet the requirements of the proposed regulations.

### 3. Direct Costs of Compliance

For each regulatory requirement and affected stakeholder group, direct costs have been calculated using the SCM method and assumptions described above. Costs were calculated for each year over a 25 year time horizon, from 2016 to 2040, and expressed in constant dollar values (2015\$). Present value (PV) costs were calculated using a 7% discount rate over the 25 year period, as well as average annual costs.<sup>5</sup> Appendix 1 contains the detailed assumptions, calculations and estimated direct compliance costs for each stakeholder group

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<sup>5</sup> Annualized costs, which differ from average annual costs, were not calculated. Annualized values are only required to enable comparison across various regulatory/policy options with different time periods.

and regulatory requirement. Table 6 below provides a summary of the total direct compliance costs by stakeholder group.

**Table 6: Summary of Estimated Direct Compliance Costs**

Affected Stakeholder Group	Average Annual Cost	Present Value Cost
Seed Vendors	\$1,724,000	\$22,125,000
Seed Sales Representatives	\$330,000	\$4,258,000
Professional Pest Advisors	\$1,900	\$30,100
Farmers	\$24,246,000	\$307,286,000
<b>Total Direct Costs</b>	<b>\$26,301,900</b>	<b>\$333,699,100</b>

Direct costs to businesses in Ontario to comply with the proposed regulations are estimated to be over \$26 million per year, or a present value cost of over \$330 million (25 year time period, 7% discount rate). **Ontario farmers will pay 92% of these costs, totalling over \$24 million per year** (present value costs of over \$300 million).

It is important to note that a number of direct compliance costs that are identified and described in Appendix 1 were not estimated, due to lack of information. This combined with conservative assumptions used throughout the analysis means that the direct compliance costs shown in Table 6 should be considered a lower bound.

#### 4. Overall Costs and Benefits to Ontarians

The analysis above focused on estimating direct compliance costs to business stakeholders. However, we presume that in accordance with the Ontario Regulatory Policy, a full Regulatory Impact Analysis (RIA)<sup>6</sup> will be prepared by government officials and results from the RIA will be used to inform Cabinet before a final decision is made on the proposed regulations.

It is standard practice worldwide that sound RIA should provide a full evaluation of the overall costs and benefits of proposed regulations, and compare them to the costs and benefits of other alternative policy options that could be implemented to achieve the government's public policy objectives.<sup>7</sup> The goal of RIA is to provide decision-makers with the best possible information to inform their choices.

Below we provide an assessment of the full costs of the proposed regulation, taking into account indirect costs (defined earlier in this report), as well as costs to government and costs to Ontarians. We also discuss the potential benefits of the proposed regulation.

<sup>6</sup> The Ontario Regulatory Policy, July 2014, requires that "proposed Ontario regulations must be accompanied by a regulatory impact assessment".

<sup>7</sup> RIA involves a generally accepted standard processes, analytical requirements and formats around the world. For information on the value of RIA, and best practices from around the world, see the numerous reports and publications at the OECD RIA website at <http://www.oecd.org/gov/regulatory-policy/ria.htm>

## 4.1 Other Costs of the Proposed Regulation

### Indirect Costs to the Crop Production Sector in Ontario

Neonicotinoid seed treatments control important pests and have replaced use of some older pest control technologies by farmers. Neonicotinoid seed treatments also complement current crop production practices such as the use of reduced tillage or no-till for soybean and corn and earlier planting for corn.

Any reduction in use of neonicotinoids treated seeds on corn and soybean crops in Ontario will change agronomic practices at the farm level as farmers attempt to offset yield decreases, crop loss and lost income. There are limited alternative treatments available, meaning that Ontario corn and soybean farmers will “have to rely primarily on foliar insecticides, soil-applied insecticides or transgenic seeds in order to manage the insects previously management with neonicotinoid seed treatments.”<sup>8</sup> Changes to agronomic practices could include mechanical controls (e.g. increased tillage) and a return to older pesticide application methods and frequency.

In their July 2014 report, *The Value of Seed Treatments for Ontario Growers*, the Conference Board of Canada estimated the farm level and overall costs to Ontario of a ban on use of neonicotinoid treated seeds in corn and soybean production. The study developed farm-level models to estimate the revenue losses to corn and soybean farmers due to lost yield and cost of alternative pest control practices. Overall economic impacts on Ontarians were then estimated using input-output modeling.

#### Implied Acceptance of a 10% Loss in Yield

As noted earlier in this report, the government’s guideline, *Conducting a Pest Assessment for Class 12 Pesticides*, (which, by virtue of being incorporated by reference into the proposed regulations, would have the force of law) sets an acceptable stand loss threshold of 15% for corn, and 30% for soybeans:

*“In order to use a Class 12 pesticide, one of the legal requirements to be met is that the following thresholds must be met or exceeded:*

- i. In order to conclude that a Class 12 pesticide may be used on a farm unit, the percent stand loss in corn must be equal to or greater than 15%.*
- ii. In order to conclude that a Class 12 pesticide may be used on a farm unit, the percent stand loss in soybean must be equal to or greater than 30%.”*

RIAS Inc. conducted a review of the agronomic literature, and found that a 15% stand loss in corn equates to over an 11% loss in yield. For soybeans, a 30% stand loss equates to about a 9.5% loss in yield.

Overall, the stand loss thresholds in the guideline suggest that an average yield loss of over 10% for corn and soybean acres in Ontario is an acceptable outcome to the government of Ontario.

<sup>8</sup> Conference Board of Canada, page 15.

While the Conference Board study estimated the impacts of a total ban, it was a conservative estimate of the impacts of the loss of neonicotinoids in Ontario, for the following reasons:

- At the time the Conference Board report was being prepared, Ontario had not issued a proposed regulation, so their report could not consider the costs for farmers to comply with detailed regulatory requirements.
- The Conference Board study averaged the impacts of 4 scenarios. Now that the proposed regulations have been published, the worst case scenario of a 10% loss in yield is the most likely outcome, due to the implied acceptance of the government of a 10% loss in yield for corn and soybeans (see text box above - *Implied Acceptance of a 10% Loss in Yield*).
- The study did not estimate the impact on off-farm income (due to increased time spent by farmers to manage pests, and the additional time/cost that the proposed regulations will impose on farmers who act as seed dealers).

For the indirect cost impacts of the proposed regulation, RIAS Inc. based our estimates on the most likely cost scenario from the Conference Board report (scenario 4, with a 10% yield loss) for the reasons cited above. To provide an estimate the indirect costs on the crop production sector in Ontario we calculated the impacts on GDP based on scenario 4 in the Conference Board report, and scaled the results by 80%. This assumes that if implemented, the proposed regulations would achieve their stated objective of reducing use of neonicotinoids by 80%.<sup>9</sup> Results are shown in table 7 below.

**Table 7: Indirect Impacts on the Ontario Corn and Soybean Sector (\$ millions)**

	Average Annual Cost	Present Value Cost
Revenue	\$882.1	\$10,280.1
Profit	\$142.5	\$1,660.2
Wages	\$94.9	\$1,105.8
Corn Production (t)	2,612,000	65,299,440
Soy Production (t)	1,028,000	25,687,593
Direct Contribution to GDP	\$345.1	\$4,021.5

On average, it is estimated that the proposed regulations will reduce incomes (revenues) for corn and soybean farmers in Ontario by over \$880 million per year. Corn production is expected to fall by over 2.6 million tonnes per year, and soybean production by over 1 million tonnes per year.

<sup>9</sup> By our calculations, the 4<sup>th</sup> scenario (10% yield reduction) would result in greater impacts than the average of the 4 scenarios shown in the Conference Board report for a total ban on use of neonicotinoids, by a factor of 1.7. We then scaled these results by the 80% reduction goal of the regulations and adjusted for inflation. Overall, our estimated economic impacts shown in Table 7 are approximately 39.5% higher than the Conference Board's results. Since production volumes are not inflation adjusted, our production impacts are about 36.1% higher than the Conference Board impacts.

Results in Table 7 show how severe the impacts of a 10% reduction in yield can be for Ontario corn and soybean farmers. For example, the estimated production losses of over 3.6 million tonnes represent a 30% loss of total corn and soybean production in Ontario. How is that possible? In the box below, we repeat the explanation provided by the Conference Board of Canada on the impact of yield loss on production:

### **A Small Impact on Yields or Costs Can Have a Large Impact on Production**

At first glance, a 5 or 10 per cent reduction in farm yields seems small and unlikely to heavily influence production decisions. However, by considering what this means for individual farm income, it is easier to see how the impacts can potentially be large.

For example, a typical farm has operating profit margins in the range of 10 to 15 per cent. This means that a farm with total revenues of \$300,000 may have profits in the range of \$30,000 to \$45,000. Without any pricing power - the ability to freely raise prices charged to customers - a hit to crop yield is also a direct hit on the bottom line. A negative yield impact of 10 per cent, for example, reduces profit to just \$0 to \$15,000, down from \$30,000 to \$45,000.

It is easy to see that farms faced with a potentially permanent yield impact of that size would have to adjust one way or another. Ideally, the farm operator would find ways to increase productivity and/or reduce the cost of inputs to restore the initial level of profitability, though one would assume they would have already taken advantage of such opportunities. More likely adjustments would include looking for opportunities to plant other crops, reducing marginally profitable acreage, or simply exiting the business altogether. We do not assume that there is any significant opportunity to plant alternative crops, and if there were, it is likely they would be less profitable (otherwise, we would already see a greater uptake of those crops).

If the same impact hits an entire industry, it may be able to increase prices collectively to pass some of the negative impact on to their customers. However, if their customers have access to other sources of supply that have not been hit with the impact, it is unlikely that those affected will be able to increase their prices. Since agricultural crops, including corn and soybeans, are generally traded internationally, it is unlikely that Ontario producers would be able to exert any significant pricing power if they were subject to restrictions that did not affect their competitors, particularly those in the United States.

Conference Board of Canada. "The Value of Seed Treatments for Ontario Growers", pp 44-45.

### **Indirect Costs to the Seed Sector in Ontario**

Some seed vendors believe that the proposed regulations will have the effect of completely restructuring the seed sector in Ontario. The complexity and the costs of the proposed regulations for seed vendors may force many farmer/seed dealers to exit the business. This will reduce competition in the sector and, as noted above, reduce off-farm income for some Ontario farmers.

For those seed vendors who remain in the business, there will be a number of indirect costs that result from the proposed regulations, if implemented. Those costs include:

- Increased logistics costs
- Increased inventory management costs in predicting the volumes of both treated and non-treated seeds that would be required each year by farmers
- Increased costs to company replant policies offered to customers

Of these, seed vendors were able to provide RIAS Inc. with information regarding the increased costs to company replant policies, due to increased crop loss/failure resulting from the proposed regulations. With reduced yields due to the restrictions on neonicotinoid use, seed companies estimate potential annual increases in replant costs based on current costs of \$140 /acre in corn and \$25/acre in soybeans. These costs are estimated to total over \$24 million per year (see Table 8).

### Costs to Government

Government costs to implement the regulation must be included in RIA. Often governments make the mistake of assuming that there are no costs, because there is no new budget allocation for implementing the regulation. Even without new resources, the regulation imposes an “opportunity cost” on government. All time and effort spent on implementing the new regulation is time not spent on other, existing activities carried out by government.

We have estimated some of the costs to government:

- The government has undertaken to pay for the IPM training for farmers if the course is taken before September 2016. If 14,318 farmers take the course, assuming a cost of \$105/course, the cost to the government would be just over \$1.5 million.
- The regulations require that the government to receive, process and post the data reported by seed vendors on the Government of Ontario website. Based on 900 vendors submitting 2 annual reports, we estimate the admin staff time for government to be about \$63,000 per year. This cost does not include any IT or management overhead costs.
- If the regulatory amendment becomes law, it is likely that the lead Ministry will have to prepare additional guidance and procedure documents for stakeholders and for compliance and enforcement staff. This cost has not been estimated.
- The government will also have to carry-out increased compliance and enforcement activities to ensure the new regulatory requirements are adhered to. While we did not estimate this cost, it could be considerable. It would require estimating the opportunity cost of time spent enforcing new regulations based on hours spent by field staff enforcing the new regulatory requirements.
- Yield losses that would result from implementing restrictions on neonicotinoids will increase pay-outs under crop insurance programs, and will increase costs of those cost shared programs for the Ontario government. As noted above, over time the level of compensation paid by government will erode as yields fall, meaning that increased insurance payouts will fall over time. While government compensation pay-outs will decrease, farmers’ incomes will fall. These costs have not been estimated.

## Costs to Ontarians

Similar to the approach above for indirect impacts on the crop production sector, to estimate the impacts on Ontarians, we multiplied the Conference Board's estimate of reduced GDP (indirect and induced impacts on GDP only) for the Ontario economy by 80%. Results are shown in Table 8 below.

Again, we believe that using the Conference Board estimates underestimates the costs to Ontarians, for the following reasons:

- Since the regulations had not yet been proposed, the estimates of the macro-economic impacts on the Ontario economy could not take into account the impacts on the seed sector of the proposed regulations. These costs would have had spill-over effects on Ontario's economy.
- The regulations could impose increased environmental costs on Ontarians. Changes in agronomic practices that will result from the regulations means more "iron in the field". Alternative insecticide treatments require more field applications by farmers. Increased tillage may also occur. Both practices will increase fuel use, which will increase GHG emissions in Ontario. Increased tillage would also increase soil degradation. These environmental costs have not been estimated.

## 4.2 Total Costs of the Proposed Regulation

Table 8 below provides a summary of the estimated total costs of the proposed regulation. Total costs are estimated to be more than \$660 million per year, or a present value cost of over \$7.7 billion.

**Table 8: Estimated Total Costs of the Proposed Regulation (\$ millions)**

	Average Annual Cost	Present Value Cost
<b>Direct Costs to Business</b> (from Table 6)	\$26.3	\$333.7
<b>Indirect Costs to Business</b>		
Crop production (direct impacts on Ontario GDP from Table 7)	\$345.1*	\$4,021.5*
Seed sector (increased replant policy costs only)	\$24.5**	\$306.0**
<b>Costs to Government</b>	\$0.125**	\$2.3**
<b>Costs to Ontarians</b> (indirect and induced impacts on GDP for Ontario)	\$265.7*	\$3,096.6*
<b>Total</b>	<b>\$661.8</b>	<b>\$7,760.2</b>

\* Assumes that the regulation achieves its objective of 80% reduction in neonicotinoid treated seed use. Our estimated impacts on GDP are about 39.5% higher than the Conference Board's estimates of the impacts of a total ban on neonicotinoid use, as explained in footnote 9.

\*\* Only some of the costs were quantified

### 4.3 Benefits of the Proposed Regulation

While a preparation of a full RIA was beyond the scope of our assignment for this project, RIAS Inc. conducted in-depth research, including a review of the literature and background information related to the proposed regulations, and the bee pollinator health issue. Based on this investigation, we were unable to estimate benefits to Ontarians of the proposed regulation, for the following reasons:

1. No credible data or analysis exists in the literature or in the background policy information that can be used to estimate the *incremental* impact, if any, that the proposed regulations might have on bee health.
2. We have found no assessment of the expected impact of other policy measures, some of which are already being implemented by stakeholders in response to the PMRA's Notice of Intent and the National Bee Health Roundtable. As a result, no baseline could be established for an analysis of benefits.

For these reasons, and a host of others that would have to be addressed in a full RIA, it is impossible to predict that the proposed regulations to reduce NNI use by 80% will have any incremental impact on winterloss beyond other measures already being implemented. **To be clear, the incremental benefits of the proposed regulations cannot be estimated, because there is nothing to indicate that there could be any incremental benefits.**

## Appendix 1: SCM Model Results

### Seed Vendors

	Regulatory requirement	Calculations and Assumptions	Unit cost	# of units	Time (hours)	Wage (\$/hr)	Type, frequency	Average Annual Cost	Present Value Cost (@7%, 25 years)
1	Learning about regulatory requirements	Number of vendors x 8 hours x expert consultant wage		900	8	\$48.00	Admin cost, upfront	\$13,800	\$345,600
2	A person who sells, offers to sell or transfers a Class 12 pesticide will need to obtain a new licence to sell Class 12 pesticides, with renewal every 5 years	\$200 for license x number of vendors + time (number of vendors x 1 hour x admin staff wage	\$200	900	1	\$34.00	Admin cost, Upfront, then every 5 years	\$42,100	\$598,600
3	A person who sells, offers to sell or transfers a Class 12 pesticide will need to get IPM training, with renewal every 5 years	Assume same time and cost as Grower Pesticide Safety Course (\$105 + full day)	\$105	900	8	\$48.00	Admin cost, Upfront, then every 5 years	\$88,000	\$1,250,900
4	A Treated Seed Vendor must disclose in all advertising whether corn and soybean seeds being sold are Class 12 pesticides and whether they contain imidacloprid, thiamethoxam or clothianidin	Based on seed company estimate of \$15,000 to revise and print Seed Guides x number of seed companies (30) in year 1 only. Assume no incremental cost for Seed Guide printing in future years	\$15,000	30			Operating cost, yr 1	\$18,000	\$450,000
5	When a vendor advertises a Class 12 pesticide he or she must also advertise that corn and soybean seeds not treated with neonicotinoid insecticides are available for sale.	Included above							
6	A vendor is required to verify that a customer purchasing Class 12 pesticides is either trained in	Estimated number of sales transactions (# of farm units x 42%) x 2		17,489	2	\$34.00	Admin cost, annual	\$1,189,200	\$14,829,200

	Regulatory requirement	Calculations and Assumptions	Unit cost	# of units	Time (hours)	Wage (\$/hr)	Type, frequency	Average Annual Cost	Present Value Cost (@7%, 25 years)
	integrated pest management or a Treated Seed Vendor.	hours x admin wage							
7	The vendor must report the sale of Class 12 pesticides and non-treated corn and soybean seeds annually to the Ministry of the Environment and Climate Change.	Number of vendors x 8 hours x admin wage		900	8	\$34.00	Admin cost, annual	\$244,800	\$3,052,500
8	The vendor must provide the Ministry of the Environment and Climate Change with a list of all Class 12 pesticides that the vendor intends to offer for sale in Ontario on an annual basis.	Number of vendors x 4 hours x admin wage		900	4	\$34.00	Admin cost, annual	\$122,400	\$1,526,200
9	The vendor must ensure that sales representatives receive necessary training, for example to ensure that sales representatives can identify Class 12 pesticides.	Number of seed companies x 8 hours x expert consultant wage		30	8	\$36.00	Admin cost, upfront, then annual time for new sales reps (1 hr per)	\$4,500	\$58,200
10	Sales representatives are required to carry company identification provided by a Treated Seed Vendor.	Number of sales reps x \$10 for i.d. in yr 1, then for each new sales rep in future years (assume 10% turnover rate)		1200	\$10.00		Operating cost, upfront, then for new sales reps (10% each year)	\$1,600	\$25,800
<b>Total:</b>								<b>\$1,724,000</b>	<b>\$22,125,000</b>

**Seed Sales Representatives**

	Regulatory requirement	Calculations and Assumptions	Unit cost	# of units	Time (hours)	Wage (\$/hr)	Type, frequency	Average Annual Cost	Present Value Cost (@7%, 25 years)
1	Learning about regulatory requirements	Included in time for training below							
2	Sales representatives must complete any training for seed dealer representatives that is provided by the treated seed vendor.	Number of sales reps x 1 hour x sales rep wage		1200	1	\$36.00	Admin cost, upfront, then annual time for new sales reps (1 hr per)	\$5,900	\$92,700
3	Sales representatives must provide, to the vendor, copies of documentation required to be provided by purchasers of Class 12 pesticides.	Estimated number of sales transactions (# of farm units x 42%) x 0.25 hours x sales rep wage		17,489	0.25	\$36.00	Admin cost, annual	\$157,400	\$1,962,700
4	Sales representatives must keep copies of the written and IPM declaration and pest assessment reports for at least four years.	\$200 estimated value of storage space (cost of a filing cabinet) in yr 1 + estimated number of sales transactions (# of farm units x 42%) x 0.25 hours x sales rep wage	\$200	17,489	0.25	\$36.00	Upfront operating cost, ongoing admin cost	\$167,000	\$2,202,700
<b>Total:</b>								<b>\$330,000</b>	<b>\$4,258,000</b>

**Farmers**

	Regulatory requirement	Calculations and Assumptions	Unit cost	# of units	Time (hours)	Wage (\$/hr)	Type, frequency	Average Annual Cost	Present Value Cost (@7%, 25 years)
1	Learning about regulatory requirements	Number of farmers x 8 hours x farm operator wage		14,318	8	\$47.00	Admin Cost, upfront	\$215,300	\$5,383,600
2	<u>Integrated Pest Management Training</u> : In order to plant Class 12 pesticides a person must complete a course on the use of Class 12 pesticides. Following successful completion of the course, a certification number will be given. This certification would be valid for five years.	Yr 1 - Number of farmers x 8 hours x farm operator wage Every 5 years - same calculation as above + cost of IPM course	\$105	14,318	8	\$47.00	Admin cost, Upfront, then every 5 years	\$1,008,600	\$14,517,500
3	<u>Voluntary Reduction Approach</u> : For the 2016 growing season, a person is allowed to purchase and use Class 12 pesticides for up to 50 per cent of the land that will be planted with corn and soybean [percentage of an operation's total land that will be planted with corn or soybean]. A person would be able to purchase Class 12 pesticides by providing a written declaration to the vendor stating that he or she will not purchase more than the maximum allowed under this approach.	Yr 1 - Number of farmers x 1 hour x farm operator wage		4,010	1	\$47.00	Operating cost, upfront	\$7,500	\$188,500

**Pest Assessment Report**

	Regulatory requirement	Calculations and Assumptions	Unit cost	# of units	Time (hours)	Wage (\$/hr)	Type, frequency	Average Annual Cost	Present Value Cost (@7%, 25 years)
4	1. Soil Pest Scouting Assessment - A pest assessment can be completed by an IPM trained farmer. After the 2016 growing season, a pest assessment must be completed by a professional pest advisor every <u>three years</u> (phased in over 2017-2020).	Farmers - 2 out of 3 years – Average number of farm units subject to scouting test per year (excluding those on micro sized farms) X 3 hours x farm operator wage	2/3	55,973	3	\$47.00	Operating cost, 2 of every 3 years	\$7,896,000	\$98,558,500
		Professional pest advisor - every 3rd year – Average number of farm units as above X 3 hours x expert consultant wage	1/3	27,986	3	\$100.00	Operating cost, 1 of every 3 years	\$8,400,000	\$104,849,500
5	2. Crop Damage Pest Assessment - This pest assessment confirms damage to crops from grubs, wireworms, seed corn maggot and corn rootworm in corn. The report from a professional pest advisor must verify that field crop damage was due to grubs, wireworms, and that there was at least a 15 per cent stand loss in corn or 30 per cent stand loss in soybean.	Average number of farm units subject to scouting test x 1 hours x expert consultant wage		67,142	1	\$100.00	Operating cost, ongoing	\$6,718,100	\$83,788,300

	Regulatory requirement	Calculations and Assumptions	Unit cost	# of units	Time (hours)	Wage (\$/hr)	Type, frequency	Average Annual Cost	Present Value Cost (@7%, 25 years)
6	Compliance with Tag - Use of Class 12 pesticides: - minimize dust emission - use a dust-reducing fluency agent if a seed flow lubricant is being used - avoid equipment maintenance in areas that may affect bee colonies or where bees are foraging	Not estimated, assumes that growers are already complying with PMRA best practice guidance							
<b>Total:</b>								<b>\$24,246,000</b>	<b>\$307,286,000</b>

**Professional Pest Advisors**

	Regulatory requirement	Calculations and Assumptions	Unit cost	# of units	Time (hours)	Wage (\$/hr)	Type, frequency	Average Annual Cost	Present Value Cost (@7%, 25 years)
1	Learning about regulatory requirements	Number of pest advisors x 4 hours x expert consultant wage, then for each new past advisor in future years (assume 10% turnover rate)		35	4	\$100.00	Admin cost, upfront, then annual for new crop advisors	\$1,900	\$30,100
2	A person certified as a Certified Crop Advisor (CCA) by the Ontario Certified Crop Advisor Association, a person certified as a Certified Professional Agronomist (CPAg) by the American Society of Agronomy, a person registered as a member under the Ontario Institute of Professional Agrolgists or a person that the Ministry of the Environment of Climate Change deems to have equivalent qualifications.	Cost to certify additional pest advisors to meet demand. Would include cost of recruiting, training and certifying as many as 280 new advisors. Not estimated.							
<b>Total:</b>								<b>\$1,900</b>	<b>\$30,100</b>