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# Canadian Environmental Sustainability Indicators

## Household Use of Chemical Pesticides and Fertilizers



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# Canadian Environmental Sustainability Indicators

## Household Use of Chemical Pesticides and Fertilizers

March 2016

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## Part 1. Household Use of Chemical Pesticides and Fertilizers Indicator

Chemical pesticide and fertilizer use by Canadian households has declined since 1994.

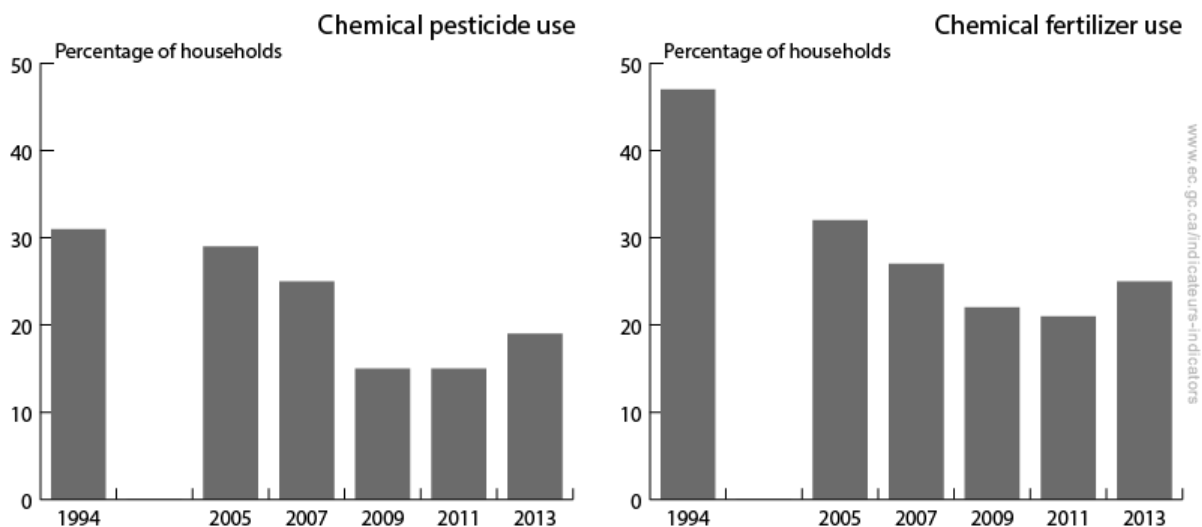
In 2013, 19% of Canadian households with a lawn or garden used chemical pesticides compared to 31% in 1994. The largest decrease has occurred in Quebec, where household chemical pesticide use fell from 30% to 9%. The Prairie Provinces, led by Saskatchewan, remain the region where household use of chemical pesticides was the most widespread.

Cosmetic pesticide bans in the majority of provinces have contributed to the drop in pesticide use between 1994 and 2013. In general, provinces with bans used below the national average in 2013 (e.g., Newfoundland and Labrador [16%], Ontario [16%], Nova Scotia [14%], New Brunswick [11%], Quebec [9%], and Prince Edward Island [7%]).

In 2013, 25% of Canadian households with a lawn or garden used chemical fertilizers, compared to 47% in 1994. The largest decreases occurred in Quebec and Ontario. Quebec households were the lowest users of chemical fertilizers in 2013. Households in the Prairie Provinces, led by Alberta, were most likely to have used chemical fertilizer.

A number of factors, such as weather, have an impact on the use of chemical pesticides and fertilizers. Changes in those contributing factors may explain the yearly variation observed in the indicators.

**Figure 1. Percentage of households in Canada with a lawn or garden using chemical pesticides and fertilizers, 1994, 2005, 2007, 2009, 2011 and 2013**



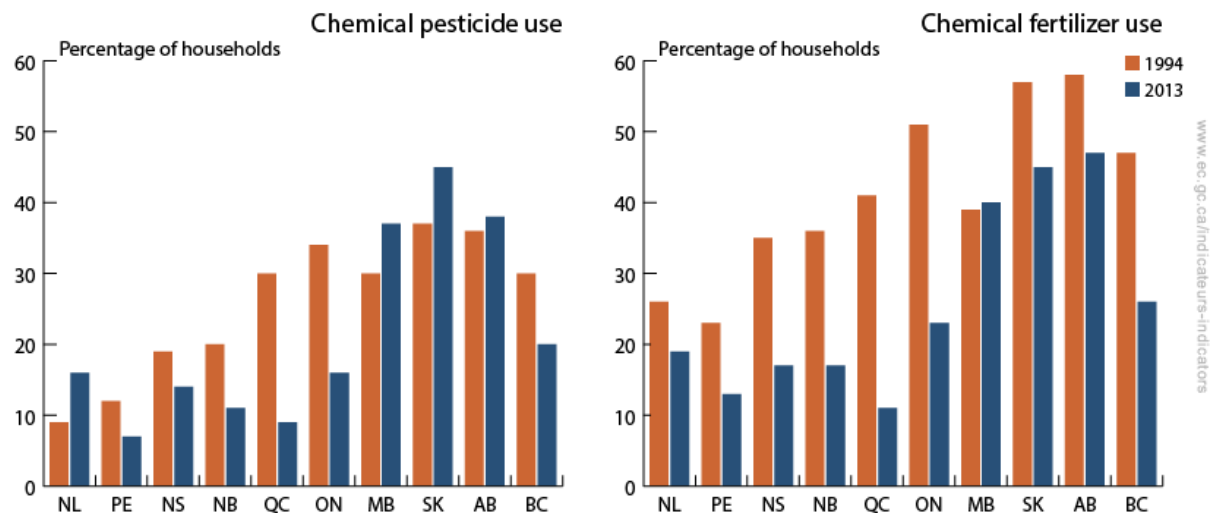
[Data for Figure 1](#)

**Source:** Statistics Canada (2015) [Households and the environment survey, use of fertilizer and pesticides, Canada, provinces and census metropolitan areas: CANSIM Table 153-0064](#). Statistics Canada (2013) [Households and the Environment 2011](#). Statistics Canada (2011) [Households and the Environment 2009](#). Statistics Canada (2009) [Households and the Environment 2007](#). Statistics Canada (2008) [Households and the Environment 2006](#). Statistics Canada (1995) Households and the Environment 1994, Catalogue No. 11-526.

Pesticides are used by households to eliminate unwanted plants and insect pests to maintain a particular appearance of lawns and gardens. There are two general varieties of pesticide: natural pesticides, such as nematodes and ladybugs; and chemical pesticides, including herbicides, insecticides and fungicides, which are manufactured. Chemical pesticides can have negative effects on human and environmental health by contaminating air, water, soil and food sources. In addition to killing target insects, insecticides can kill other species beneficial to lawns and gardens. For example, insects are a source of food for many birds, but this food source can be contaminated or reduced by pesticides. Many municipalities and most provinces have, or are considering, laws restricting the use of pesticides in cities.

Fertilizers contain nitrogen, phosphorus and potassium, and are added to lawns and gardens to make them greener and thicker. There are two general varieties of fertilizers: natural fertilizers like manure and compost; and chemical fertilizers, which are manufactured. If fertilizer is applied improperly, or in excess, these nutrients can run off into stormwater sewers and eventually reach lakes and rivers. When the amount of nutrients in a river or lake becomes too high, it can cause excessive growth of aquatic plants and algae.

**Figure 2. Percentage of households with a lawn or garden using chemical pesticides and fertilizers by province, Canada, 1994 and 2013**



[Data for Figure 2](#)

**Source:** Statistics Canada (2015) [Households and the environment survey, use of fertilizer and pesticides, Canada, provinces and census metropolitan areas: CANSIM Table 153-0064](#). Statistics Canada (2013) [Households and the Environment 2011](#). Statistics Canada (2011) [Households and the Environment 2009](#). Statistics Canada (2009) [Households and the Environment 2007](#). Statistics Canada (2008) [Households and the Environment 2006](#). Statistics Canada (1995) [Households and the Environment 1994](#), Catalogue No. 11-526.

## Part 2. Data Sources and Methods for the Household Use of Chemical Pesticides and Fertilizers Indicator

### Introduction

The [Household Use of Chemical Pesticides and Fertilizers](#) indicator is part of the [Canadian Environmental Sustainability Indicators](#) (CESI) program, which provides data and information to track Canada's performance on key environmental sustainability issues.

### Description and rationale of the Household Use of Chemical Pesticides and Fertilizers indicator

#### Description

The Household Use of Chemical Pesticides and Fertilizers indicator reports on the percentage of Canadian households with lawns or gardens that reported using chemical fertilizers and pesticides in 1994 and every two years from 2005 to 2013. The data are broken down by province showing the comparison between data collected in 1994 and 2013.

#### Rationale

Chemical pesticides, including herbicides, insecticides and fungicides, are used to maintain the appearance of lawns and gardens by eliminating pests. However, chemical pesticides can have negative effects on human and environmental health by contaminating air, water, soil and food sources. For example, in addition to killing target insects, insecticides can also harm or kill other, non-target insects, soil microbes and insect-eating birds, thus disrupting the natural balance of the lawn or garden's ecosystem.

Chemical fertilizers are added to lawns and gardens to help them grow greener and thicker. However, if fertilizer is applied improperly or in excess, soluble nutrients can pollute drainage and storm waters, which eventually reach lakes and rivers. Run off of nutrient-laden water readily occurs in urban environments because there are many hard surfaces. In addition, water in storm sewers is frequently not treated before it reaches lakes or rivers, thus contributing to excessive growth of aquatic plants and algae.

#### Recent changes to the indicator

No methodological change has been made to the indicator since its last update in 2014.

### Data

#### Data source

Data for this measure come from Statistics Canada's 1994,<sup>1</sup> 2006,<sup>2</sup> 2007,<sup>3</sup> 2009,<sup>4</sup> 2011<sup>5</sup> and 2013<sup>6</sup> Households and the Environment Survey (HES).

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<sup>1</sup> Statistics Canada (1995) Households and the Environment 1994. Catalogue no. 11-526-XPB.

<sup>2</sup> Statistics Canada (2008) [Households and the Environment 2006](#). Retrieved on 13 May, 2015.

<sup>3</sup> Statistics Canada (2009) [Households and the Environment 2007](#). Retrieved on 13 May, 2015.

### **Spatial coverage**

The target population of the HES consists of Canadian households, excluding those in Yukon, Northwest Territories and Nunavut, households located on First Nations reserves or Crown lands, and households consisting entirely of full-time members of the Canadian Armed Forces.

### **Temporal coverage**

Data for 1994 as compiled in the HES 2006 report are used in this indicator. The 1994 HES was conducted as a supplement to the May 1994 Labour Force Survey.

The HES 2006 was conducted as a supplement to the Labour Force Survey from February 15 to April 15, 2006. The HES 2007, 2009, 2011 and 2013 were conducted from October to December of their respective years as a follow-up survey to the Canadian Community Health Survey.

### **Data completeness**

A representative sample of Canadian households from each province is surveyed in the HES. The 1994 HES surveyed 38 080 households and yielded an 83.1% response rate. The HES 2006 surveyed 36 431 households and yielded a 77.8% response rate. The HES 2007 surveyed 29 980 households and yielded a 72.3% response rate. Both the 2009 and 2011 HES surveyed 20 000 households and yielded response rates of 73.8% and 74.3%. The sample size for HES 2013 was 31 962 households and yielded a final response rate of 75.4%.

Household estimates in the HES are produced using weights attached to each sampled household. The weight indicates the number of households in the population represented by the sampled unit.<sup>7</sup>

### **Data timeliness**

The most recent data available at the time this indicator was produced are for 2013.

## **Methods**

In 1994 and 2006, the Households and the Environment Survey (HES) did not make the distinction between natural and chemical fertilizers and pesticides. It is reasonable, however, to assume people were only talking about chemical fertilizers and pesticides because there were not many natural remedies available. There should be no impact on the trend.

The HES 1994 data collected for this measure were based on the following question:

- In the last 12 months, did anyone, including commercial operators, apply the following chemicals to the yard, lawn or garden: pesticides or fertilizers? (Yes, No, Don't know)

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<sup>4</sup> Statistics Canada (2011) [Households and the Environment 2009](#). Retrieved on 13 May, 2015.

<sup>5</sup> Statistics Canada (2013) [Households and the Environment 2011](#). Retrieved on 13 May, 2015.

<sup>6</sup> Statistics Canada (2015) [Households and the environment survey, use of fertilizer and pesticides, Canada, provinces and census metropolitan areas: CANSIM Table 153-0064](#). Retrieved on 26 May, 2015.

<sup>7</sup> Statistics Canada (2015) [Households and Environment Survey: Data sources and methodology](#). Retrieved on 13 May, 2015.



The data collected for this measure from the HES 2006 were based on the following questions:

- In 2005, were any chemical fertilizers applied to your lawn/garden? (Yes, No, Don't know/Refused)
- In 2005, were any weed killers, pesticides, or fungicides applied to your lawn/garden? Include fertilizer and pesticide mixes like "Weed and Feed." (Yes, No, Don't know/Refused)

The HES 2007 and 2009 data collected for this measure were based on the following questions:

- In the last 12 months, were any chemical fertilizers applied to your lawn/garden/lawn or garden? (Yes, No, Don't know/Refused)
- In the last 12 months, were any chemical pesticides such as weed killers (herbicides), bug killers (insecticides), or fungicides applied to your lawn/garden/lawn or garden? Please include fertilizer and herbicide mixes such as "Weed and Feed." (Yes, No, Don't know/Refused)

The HES 2011 and 2013 data collected for this measure were based on the following questions:

- In the past 12 months, were any chemical fertilizers applied to your lawn/garden/lawn or garden? (Yes, No, Don't know/Refused)
- In the past 12 months, were any chemical pesticides such as weed killers (herbicides), bug killers (insecticides), or fungicides applied to your lawn/garden/lawn or garden? (Yes, No, Don't know/Refused)

## Caveats and limitations

The coverage error for the Households and the Environment Survey (HES) is based on the survey of which it is a sub-sample (i.e., the Labour Force Survey in 2006 and the Canadian Community Health Survey starting in 2007). In all cases, the coverage error is estimated at less than 2%.

Households located in the Yukon, Northwest Territories and Nunavut, households located on First Nations reserves and military bases, and households consisting entirely of full-time members of the Canadian Armed Forces are excluded from this study.

Estimates not meeting an acceptable level of quality were either flagged for caution or suppressed.<sup>8</sup>

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<sup>8</sup> Statistics Canada (2015) [Households and Environment Survey: Data sources and methodology](#). Retrieved on 13 May, 2015.

## Part 3. Annexes

### Annex A. Data tables for the figures presented in this document

**Table A.1. Data for Figure 1. Percentage of households in Canada with a lawn or garden using chemical pesticides and fertilizers, 1994, 2005, 2007, 2009, 2011 and 2013**

Year	Chemical pesticides (percentage of households with a lawn or garden)	Chemical fertilizers (percentage of households with a lawn or garden)
1994	31	47
2005	29	32
2007	25	27
2009	15	22
2011	15	21
2013	19	25

**Source:** Statistics Canada (2015) [Households and the environment survey, use of fertilizer and pesticides, Canada, provinces and census metropolitan areas: CANSIM Table 153-0064](#). Statistics Canada (2013) [Households and the Environment 2011](#). Statistics Canada (2011) [Households and the Environment 2009](#). Statistics Canada (2009) [Households and the Environment 2007](#). Statistics Canada (2008) [Households and the Environment 2006](#). Statistics Canada (1995) [Households and the Environment 1994](#), Catalogue No. 11-526.

**Table A.2. Data for Figure 2. Percentage of households with a lawn or garden using chemical pesticides and fertilizers by province, Canada, 1994 and 2013**

Region	Chemical pesticide use 1994 (percentage of households with a lawn or garden)	Chemical pesticide use 2013 (percentage of households with a lawn or garden)	Chemical fertilizer use 1994 (percentage of households with a lawn or garden)	Chemical fertilizer use 2013 (percentage of households with a lawn or garden)
Newfoundland and Labrador	9	16	26	19
Prince Edward Island	12	7 <sup>E</sup>	23	13 <sup>E</sup>
Nova Scotia	19	14	35	17
New Brunswick	20	11	36	17

Region	Chemical pesticide use 1994 (percentage of households with a lawn or garden)	Chemical pesticide use 2013 (percentage of households with a lawn or garden)	Chemical fertilizer use 1994 (percentage of households with a lawn or garden)	Chemical fertilizer use 2013 (percentage of households with a lawn or garden)
Quebec	30	9	41	11
Ontario	34	16	51	23
Manitoba	30	37	39	40
Saskatchewan	37	45	57	45
Alberta	36	38	58	47
British Columbia	30	20	47	26

**Note:** Values marked with an "E" should be used with caution.

**Source:** Statistics Canada (2015) [Households and the environment survey, use of fertilizer and pesticides, Canada, provinces and census metropolitan areas: CANSIM Table 153-0064](#). Statistics Canada (2013) [Households and the Environment 2011](#). Statistics Canada (2011) [Households and the Environment 2009](#). Statistics Canada (2009) [Households and the Environment 2007](#). Statistics Canada (2008) [Households and the Environment 2006](#). Statistics Canada (1995) Households and the Environment 1994, Catalogue No. 11-526.

## Annex B. References and additional information

### References and further reading

- Statistics Canada (1995) Households and the Environment 1994. Catalogue no. 11-526-XPB.
- Statistics Canada (2008) [Households and the Environment 2006](#). Retrieved on 13 May, 2015.
- Statistics Canada (2009) [Households and the Environment 2007](#). Retrieved on 13 May, 2015.
- Statistics Canada (2011) [Households and the Environment 2009](#). Retrieved on 13 May, 2015.
- Statistics Canada (2013) [Households and the Environment 2011](#). Retrieved on 13 May, 2015.
- Statistics Canada (2015) [Canadians and Nature: Fertilizers and Pesticides, 2013](#). Retrieved on 26 May, 2015.
- Statistics Canada (2015) [Households and Environment Survey: Data sources and methodology](#). Retrieved on 13 May, 2015.

### Related information

- [Government of Canada – How to have a healthy lawn](#)
- [Land Use Impacts on Freshwater Quality](#)
- [Nutrients in Lake Winnipeg](#)
- [Phosphorus and Nitrogen Levels in the St. Lawrence River](#)
- [Phosphorus Levels in the Great Lakes](#)
- [Risk to Soil and Water Quality from Agriculture](#)

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