Appendix 3: Growth Projections

Organic Task Force, 2025

This study examined the impact of tripling organic acreage for key crops in Canada as one possible scenario for organic agriculture growth. The assumptions and calculations for this scenario are presented below for the following impacts:

Tripling Organic Acreage in Canada

Acreage

Tripling organic acreage would increase certified organic farmland from 2.2% to 6.6% of Canada's total farmland. This would represent an expansion from 960,755 hectares (2.37 million acres) to 2.89 million hectares (7.12 million acres) - an increase of 1.92 million hectares (4.75 million acres), as shown in Table 1.

Table 1: Increase in Organic Area by Target Category

Category	Current Organic Area, 2022 (ha)[1]	Target Organic Area (ha)	Target Organic Area Increase (ha)
Field Crops	461,387	1,384,161	922,774
Horticulture[2]	35,029	105,087	70,058
Pasture/Forages	464,339	1,393,016	928,677
Total Hectares	**960,755**	**2,882,263**	**1,921,509**
Total in Acres	**2,374,077**	**7,122,227**	**4,748,150**
% of total Canadian Farmland[3]	**2.2%**	**6.6%**	

[1] Canada Organic Trade Association. (2022). Canadian organic acreage by crop.
[2] While these projections represent a tripling of each target category, the recommended transition program proposes a budget for horticulture transition equivalent to doubling its acreage, based on a policy decision to prioritize high-acreage categories for greater impact.
[3] Statistics Canada, *Land use, Census of Agriculture historical data (Table 32-10-0153-01)*, May 11, 2022. https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3210015301.

These figures include certified organic cropland and pasture but exclude organic land used for maple, aquaculture, and wild harvest production (which totaled 317,828 hectares, or 785,369 acres, in 2022), since these production types are not covered in the economic and environmental analysis of this study.

For consistency with this scope, total Canadian farmland was calculated using Statistics Canada's 2021 land use data, including cropland, pastureland, and summerfallow, and excluding "all other land."[4] Based on this, total farmland is considered as 43.2 million hectares (106.8 million acres).

The additional organic acreage is assumed to come from existing non-organic farmland (e.g. not from converted natural areas). Total farmland is assumed to remain constant, though this may be a limitation given recent trends of declining farmland in Canada.

Table 2 shows the projected increase in organic acreage by crop, based on a simple tripling of current certified organic acreage for major field and horticultural crops. While a more detailed projection could reflect crop-specific growth rates, this model assumes uniform growth across all crops. These crops represent the majority of existing organic acreage.

Table 2: Increase in Organic Area Detailed by Crop for Selected Crops

Crop	Total area (ha)[5]	Organic area (ha)	Proportion organic	Increase Current Organic Area 3x (new %)	Target Organic Area (ha)	Target Organic Area Increase (ha)
Wheat	10,234,572	125,923	1.23%	4%	**377,768**	251,846
Canola	8,869,043	2,915	0%	0%	**8,746**	5,831
Barley	3,060,427	18,975	1%	2%	**56,924**	37,949
Oat	1,372,628	113,870	8%	25%	**341,611**	227,741
Rye	185,727	14,308	8%	23%	**42,923**	28,615
Flaxseed	322,121	21,146	7%	20%	**63,438**	42,292
Pea	1,385,351	12,415	1%	3%	**37,245**	24,830
Lentil	1,644,438	16,785	1%	3%	**50,356**	33,571
Chickpea	104,081	16,423	16%	47%	**49,269**	32,846
Corn	1,500,631	18,609	1%	4%	**55,827**	37,218
Soybean	2,166,806	43,701	2%	6%	**131,102**	87,401
Potato	157,377	4,413	3%	8%	**13,239**	8,826
Carrot	9,317	248	3%	8%	**744**	496
Lettuce	3,711	79	2%	6%	**237**	158
Spinach	874	75	9%	26%	**225**	150
Total	**31,113,912**	**419,872**	**1.35%**	**4.05%**	**1,259,615**	**819,768**

[4] Statistics Canada, *Land use*, Census of Agriculture, 2022.
[5] Total excludes the area categorized as "other crops" not specified in the listed categories.

Tripling acreage over the next five years would require an average annual growth rate of ~25%. Organic acreage growth has plateaued between 2019 and 2023, but has increased by one-third over the past 10 years, and has more than doubled since 2005.

Operators

Tripling organic acreage in Canada over five years would **increase the number of certified organic producers by 39%**, from 5,965 in 2023[6] to 8,273. This represents the addition of 2,308 new organic farms, of which 38% (882 farms) would be primarily field crop operations and 62% (1,426 farms) horticultural operations (see Table 3).

These projections assume that 25% of the increased organic field crop acreage comes from existing organic farms expanding onto converted conventional land, while 100% of the increased horticulture acreage comes from conventional farms converting to organic or from new entrants to agriculture (with 10% new entrants, or 143 farms). Approximately 10% of organic producers are livestock or mixed operations. Based on this, we estimate that organic livestock producers could increase to around 825, or roughly 125 more than today - primarily located on field crop farms.

Table 3 presents the estimated number of new organic farms required to support the projected acreage increase. Note that this analysis covers only field crops, horticulture, and pasture/forage. It excludes maple, aquaculture, and wild harvest production, which together represented about 25% of total organic acreage in 2022. Future studies could explore growth potential and producer estimates for these production types.

To calculate average organic farm size, we used Statistics Canada data on farm counts by size category (e.g., under 10 acres, 10-69.99 acres, etc., up to 3,520 acres and over).[7] We assigned a representative size to each category (e.g., 40 acres for the 10-69.99 range), multiplied by the number of farms in each, and summed the results to estimate total acreage. We then divided total estimated acreage by the number of farms to determine average farm size by production type.

For field crops, we used NAICS category 1111 - Oilseed and Grain Farming data, assuming 3,600 acres as the average for the largest size category (3,520 acres and over). The same assumptions were applied to green manures, pastures, forages, and natural areas, as organic livestock producers are assumed to manage organic cropland as well.

For vegetable and fruit production, this method resulted in unrealistically large average acreages - likely due to inclusion of non-farmed land. Instead, we used informed assumptions of 20 acres as the average farm size for vegetables and 40 acres for fruit production.

Table 3: Estimated Operators Needed to Support Tripling Organic Acreage

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[6] Canada Organic Trade Association (COTA). *Quick Facts About Organic in Canada*, 2023 data. https://canada-organic.myshopify.com/collections/2019-quick-fact-sheets.

[7] Statistics Canada, *Farms reporting certified or transitional organic products distributed by total farm area and industry group (NAICS), Canada and provinces, 2021.*

Crop	Current Area (ac)[8]	3x Current Area (ac)	Area to be Converted (ac)	Average Organic Farm Size	New Organic Farms Needed
Field Crops and Pasture					
Cereals					
Wheat	311,162	933,486	622,324	968	643
Oats	281,379	844,137	562,758	968	581
Barley	46,887	140,661	93,774	968	97
Rye	35,355	106,065	70,710	968	73
Other cereals (triticale, millet, kamut, mixed)	44,510	133,530	89,020	968	92
Pulses					
Chickpeas	40,582	121,746	81,164	968	84
Peas	30,678	92,034	61,356	968	63
Beans	1,796	5,388	3,592	968	4
Lentils	41,477	124,431	82,954	968	86
Oilseeds					
Flax	52,254	156,762	104,508	968	108
Mustard	15,306	45,918	30,612	968	32
Soybean	107,986	323,958	215,972	968	223
Other oilseeds (incl. canola)	8,265	24,795	16,530	968	17
Other Field Crops					
Corn	45,984	137,952	91,968	968	95
Hemp	17,564	52,692	35,128	968	36
Buckwheat	11,194	33,582	22,388	968	23
Other	36,797	110,391	73,594	968	76
Green manures, forages, natural areas					
Alfalfa	55,144	165,432	110,288	968	114
Other	1,092,261	3,276,783	2,184,522	968	2,257
Field Crop & Pasture Subtotal	2,276,581	6,829,743	4,553,162	/	**4,704**
				Assumed number of crops per farm	**4**
				Total new organic field crop farms needed	**1,176**
				Assumed 25% comes from existing organic operations expanding	**294**
				Assumed remaining 75% comes from converting conventional operations	**882**
Horticulture					
Fruits					
Strawberries	263	789	526	40	13
Blueberries	23,280	69,840	46,560	40	1,164

[8] COTA. *Quick Facts About Organic in Canada*, 2022. https://canada-organic.myshopify.com/collections/2019-quick-fact-sheets.

Raspberries	211	633	422	40	11
Cranberries	3,739	11,217	7,478	40	187
Apples	1,400	4,200	2,800	40	70
Table Grapes	188	564	376	40	9
Wine Grapes	1,967	5,901	3,934	40	98
Grapes no detail	565	1,695	1,130	40	28
Pears	70	210	140	40	4
Hazelnuts	1	3	2	40	0
Nuts	459	1,377	918	40	23
Other fruits and nuts	30,502	91,506	61,004	40	1,525
Fruit Subtotal	**62,645**	**187,935**	**125,290**	/	**3,132**
Assumed number of crops per farm					**4**
Total new organic fruit farms needed					**783**
Vegetables					
Potatoes	10,905	32,715	21,810	20	1,091
Lettuce	195	585	390	20	20
Cauliflower	176	528	352	20	18
Broccoli	710	2,130	1,420	20	71
Carrots	613	1,839	1,226	20	61
Spinach	185	555	370	20	19
Cucumber	519	1,557	1,038	20	52
Eggplant	50	150	100	20	5
Leek	349	1,047	698	20	35
Tomato	664	1,992	1,328	20	66
Pepper	767	2,301	1,534	20	77
Other vegetables	36,272	108,816	72,544	20	3,627
Veg Subtotal	**51,405**	**154,215**	**102,810**	/	**5,141**
Assumed number of crops per farm					**8**
Total new organic vegetable farms needed					**643**
Total new organic horticulture (fruit + vegetable) farms needed					**1,426**
Total new organic farms (field crop + horticulture) needed (including assumption that 25% of growth in organic field crop acreage comes from existing organic operations expanding)					**2,308**
Number of new entrants to agriculture sector (assuming 10% of new horticulture acreage comes from new entrants)					**143**
Total organic operations (5,965, current as of 2022 + 2,308)					**8,273**

Economics

Tripling organic acreage would **increase farmers' net returns by $1.73 billion over 10 years** (about $173.7 million annually). This includes approximately $129.9 million per year from select field crops and $43.8 million per year from select horticultural crops. These

figures summarize 10 field crops and 4 horticultural crops included in the study and represent a snapshot of the potential impact if all crops were considered.

The additional net income estimates include transition costs. Table 4 presents the additional farm net income by crop for the 10 years following the start of organic transition, averaged annually over that period.

Table 4. 10-Year Increase in Producer Net Returns Per Year

Crop	10-year Annual Increase in Producer Net Returns ($/yr)
Barley	**2,109,207**
Chickpeas	**1,364,615**
Corn	**66,416,655**
Flaxseed	**10,707,988**
Lentils	**2,482,994**
Oats	**-26,654,755**
Peas	**-5,379,298**
Rye	**7,768,614**
Soybeans	**59,149,983**
Wheat	**22,117,742**
Field Crops Subtotal	**129,888,104**
Carrots	**1,661,107**
Lettuce	**3,425,570**
Potatoes	**45,215,377**
Spinach	**974,973**
Horticulture Subtotal	**43,821,144**
Total	**173,709,247**

Emissions

Tripling organic acreage would **reduce greenhouse gas (GHG) emissions by 769 kt CO_2e annually** based on per-area life cycle assessment (LCA) data (see Table 5), or by 312 kt CO_2e annually based on per-unit production LCA data (see Table 6). These projections do not include any emissions changes from the additional incorporation of green manures or converted pastureland.

Currently, the 14 analyzed crops (organic and conventional combined) generate 26.154 Mt CO_2e per year. With organic acreage tripled, emissions would decline to 25.843 Mt CO_2e, a 1.2% reduction. These totals exclude canola production, as it is not part of the organic expansion scenario.

Table 5: Estimates of current emissions and emission with a three-fold organic area

expansion from organic and conventional production in Canada by crop, calculated using absolute (per area) emissions data[9]

Crop	Emissions reduction factor for organic (per ha)	Increase Current Organic Area 3x (new area %)	Current total emissions (kt CO2e)	Total emissions with target (kt CO2e)	Emissions decline with target (kt CO2e)
Field Crops					
Barley	0.53	2%	3,418	3,376	-41
Chickpeas	0.65	47%	57	41	-16
Corn	0.99	4%	4,547	4,490	-57
Flaxseed	0.65	20%	268	237	-31
Lentils	0.65	3%	934	918	-16
Oats	0.89	25%	1,687	1,516	-171
Peas	0.65	3%	1,077	1,061	-16
Rye	0.65	23%	186	161	-25
Soybeans	0.65	6%	1,807	1,745	-62
Wheat	0.40	4%	11,378	11,068	-310
Horticultural Crops					
Potatoes	0.53	8%	407	385	-22
				Total	**-769**

Table 6: Estimates of current emissions and emissions with a three-fold organic area expansion from organic and conventional production in Canada by crop, calculated using relative (per unit mass) emissions data

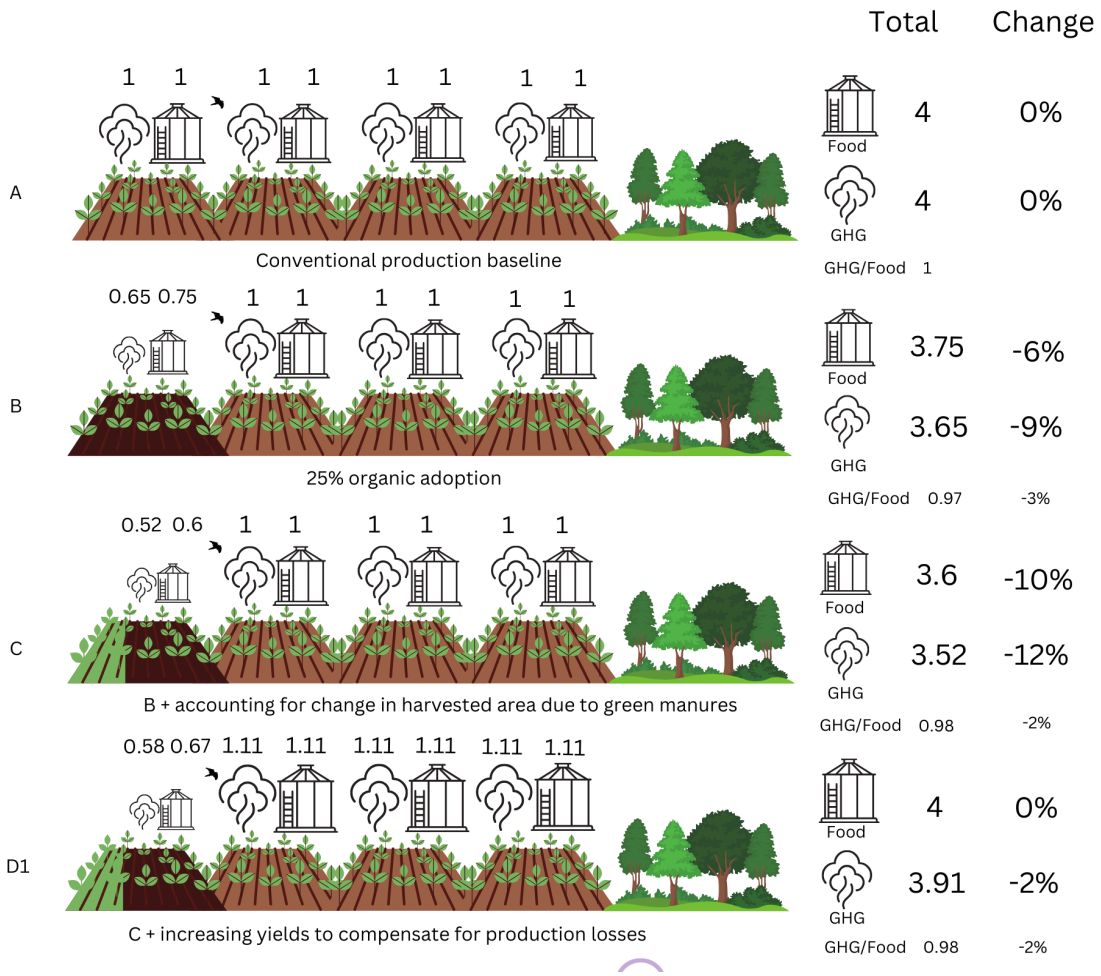
Crop	Emissions reduction factor for organic (per kg yield)	Increase Current Organic Area 3x (new area %)	Current total emissions (kt CO2e)	Total emissions with target (kt CO2e)	Emissions decline with target (kt CO2e)
Field Crops					
Barley	0.53	2%	3,576	3,549	-27
Chickpeas	0.84	47%	36	30	-6
Corn	0.81	4%	5,724	5,687	-37
Flaxseed	0.78	20%	231	218	-13
Lentils	0.84	3%	727	719	-8
Oats	1.25	25%	1,971	1,936	-35
Peas	0.84	3%	938	929	-9
Rye	0.57	23%	240	218	-22
Soybeans	0.77	6%	2,220	2,192	-28

[9] See Appendices 1 and 2 below for detailed methods on calculating crop emissions.

Wheat	0.70	4%	9,621	9,510	-112
Horticultural Crops					
Carrots	1.00	8%	132	130	-2
Lettuce	1.34	6%	262	261	-1
Potatoes	0.81	8%	475	463	-12
Spinach	0.33	26%	2	2	0
				Total	**-312**

In a more ambitious scenario where organic production reaches 25% of total farmland, compared to no organic production, total agricultural emissions could be reduced by 12% (see Figure 1). However, if production declines associated with organic production are compensated elsewhere in the food system, the net impact could be smaller or even negative. This highlights the importance of strategic policies and approaches to avoid unintended consequences.

Figure 1: Impacts of Expanding Organic Agriculture on (Agri-)Food Production and GHG Emissions



Scenarios (B-D), above, increasingly account for the impacts of changes in production – from yield changes (B) to changes in harvested area due to green manures (C) to compensating to maintain overall food production.

Production

Tripling organic acreage would increase organic production of the analyzed crops from 832,320 tonnes to 2.14 million tonnes, while shifting conventional production of these crops from 60.64 million tonnes to 58.44 million tonnes, assuming total farmland remains unchanged.[10] This means total crop production would change by -1.45% (-893,280 tonnes).

This projection covers only the 14 crops listed below and excludes canola, which is not part of the organic expansion scenario. It also accounts for a 20% lower cropping intensity on newly converted organic land, reflecting factors such as increased use of green manures in organic systems.[11] However, it does not factor in potential productivity gains from future research or technical support for organic farming.

Table 7: Change in Total Annual Production from Projected Increase in Organic Production[12]

Crop	Current Estimated Conventional Production (tonnes dry matter per year)	Current Estimated Organic Production (t DM/yr)	Current Total Production (t DM/yr)	Conventional Production with Target (t DM/yr)	Organic Production with Target (t DM/yr)	Total Production with Target (t DM/yr)
Field Crops						
Barley	8,294,527	39,032	8,333,559	8,191,034	117,097	8,308,131
Chickpeas	91,786	9,784	101,570	57,393	29,353	86,746
Corn	12,889,720	146,792	13,036,512	12,566,018	440,377	13,006,395
Flaxseed	330,449	17,645	348,094	284,015	52,934	336,949
Lentils	1,682,002	9,869	1,691,871	1,647,311	29,607	1,676,918
Oats	3,441,275	222,362	3,663,637	2,818,663	667,085	3,485,748
Peas	2,456,727	12,640	2,469,367	2,412,297	37,919	2,450,216
Rye	481,817	30,563	512,380	401,387	91,690	493,077
Soybeans	5,761,532	90,966	5,852,498	5,524,349	272,899	5,797,248
Wheat	23,895,775	226,076	24,121,851	23,300,439	678,227	27,530,041
Horticulture						
Carrots	39,633	817	40,450	37,465	2,450	39,915
Lettuce	8,192	125	8,317	7,836	375	8,211
Potatoes	1,262,697	25,603	1,288,300	1,189,840	76,810	1,266,650
Spinach	640	46	686	520	137	657

[10] See Appendix 2 below for detailed methods on calculating crop emissions.
[11] Alvarez (2022) reported that the intensity of soil use (the portion of the crop rotation in which crops were harvested) was 20% lower in organic systems, based on 84 on-farm organic-conventional comparisons. See: Alvarez, R., Comparing Productivity of Organic and Conventional Farming Systems: A Quantitative Review, *Archives of Agronomy and Soil Science* 68, no. 14 (2022): 1947-1958. https://doi.org/10.1080/03650340.2021.1946040.
[12] See Appendix 2 below for detailed methods on calculating crop emissions.

Total	**60,636,771**	**832,320**	**61,469,091**	**58,438,565**	**2,496,960**	**60,935,526**
Total with 20% Lower Cropping Intensity on Newly Converted Organic Land*					**2,137,246**	**60,575,811**
					Change in Total	**-893,280**
					% Change	**-1.45%**

***Calculation details:**

- Additional organic production from newly converted land (yield difference only): 2,496,960 - 865,803 = 1,631,157 tonnes
- Adjusted for 20% lower cropping intensity on newly converted organic land: 1,631,157 × 0.8 = 1,304,926 tonnes
- Total organic production after conversion and adjustment for reduced cropping intensity: 832,320 + 1,304,926 = 2,137,246 tonnes
- Total adjusted production (conventional + organic) after growth: 58,438,565 + 2,137,246 = 60,575,811 tonnes
- Change in total production compared to baseline (after cropping intensity adjustment): 60,575,811 - 61,469,091 = -893,280 tonnes (-1.45%)

Synthetic Nitrogen Fertilizer Use and Emissions

Tripling organic cropland in Canada by converting 957,803 hectares of conventional cropland (excluding pastureland) to organic production would **reduce synthetic nitrogen (N) fertilizer use by 79.5 million kg N annually**. This reduction corresponds to 0.548 Mt CO_2e per year in associated emissions reductions, contributing nearly 14% of Canada's fertilizer emissions reduction target. Expanding organic production to 25% of total farmland could achieve 124% of this target.

Reduction in Nitrogen Fertilizer Use

Dyer et al. (2024) report average multi-crop synthetic N fertilizer application rates of:[13]

- 79 kg N/ha in Western Canada
- 83 kg N/ha in Eastern Canada

Applying these averages to the converted cropland (assuming a shift from average synthetic N fertilizer application rates to zero on organic land) yields the following:

Western Canada

- Current organic cropland: 366,568 ha (74% of national)[14]
- Target (tripled) organic cropland: 1,099,704 ha
- Increase in organic cropland: 733,136 ha
- N fertilizer reduction: 733,136 ha × 79 kg N/ha = 57,917,744 kg N/year

Eastern Canada

[13] Dyer, J.A.; Pearson, A.; Desjardins, R.L. Interpolation of Nitrogen Fertilizer Use in Canada from Fertilizer Use Surveys. *Agronomy* 2024, 14, 1700. https://doi.org/10.3390/agronomy14081700.
[14] COTA. *Quick Facts About Organic in Canada*, 2022.

- Current organic cropland: 129,842 ha (26% of national)[15]
- Target (tripled) organic cropland: 389,526 ha
- Increase in organic cropland: 259,684 ha
- N fertilizer reduction: 259,684 ha × 83 kg N/ha = 21,553,772 kg N/year

Total reduction in synthetic N fertilizer use: 57,917,744 + 21,553,772 = 79,471,516 kg N/year (≈ 79,472 tonnes N/year)

Given total synthetic N fertilizer use in Canadian agriculture was 2,910,000 tonnes in 2020[16], this represents a 2.73% reduction in total N fertilizer use.

Emissions Reduction Estimate

- Total Canadian synthetic N fertilizer use (2021): ~2.9 Mt N[17]
- Total GHG emissions from synthetic N fertilizer use on agricultural land: 20 Mt CO_2e/year[18]
- Emissions intensity per unit N: 20 Mt CO_2e / 2.9 Mt N = 6.9 kg CO_2e per kg N
- Emissions reduction from tripling organic acreage: 79,471,516 kg N × 6.9 kg CO_2e/kg N = 548,353,466 kg CO_2e/year = 548,353 tonnes CO_2e/year (0.548 Mt CO_2e/year)
- Canada's target is a 30% reduction in fertilizer emissions, equivalent to 4 Mt CO_2e/year.[19]
- Contribution of tripling organic acreage to target: (0.548 / 4) × 100 = **13.7%**

Scenario: Expanding Organic to 25% of Total Farmland

- Total Canadian cropland: 37,876,632 ha[20]
- 25% organic cropland: 9,469,158 ha
- Increase from current 496,416 ha organic cropland (461,387 ha field crops + 35,029 ha horticulture): 8,972,742 ha[21]
- 74% in Western Canada = 6,639,829 ha × 79 kg N/ha = 524,546,497 kg N/year
- 26% in Eastern Canada = 2,332,913 ha × 83 kg N/ha = 193,631,772 kg N/year
- Total N fertilizer reduction: 524,546,497 + 193,631,772 = 718,178,269 kg N/year (≈ 718,178 tonnes N/year)
- Associated emissions reduction: 718,178,269 kg N × 6.9 kg CO_2e/kg N = 4,954,431,056 kg CO_2e/year (≈ 4.95 Mt CO_2e/year)

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[15] COTA. *Quick Facts About Organic in Canada*, 2022.
[16] Agriculture and Agri-Food Canada, *Reducing emissions from fertilizer use*, Government of Canada, last modified May 16, 2024. https://agriculture.canada.ca/en/environment/fertilizers-and-pesticides/reducing-emissions-fertilizer.
[17] Dyer et al., *Interpolation of Nitrogen Fertilizer Use*, 2024.
[18] Farmers for Climate Solutions, *Agricultural Policy Framework Recommendations: Technical Emissions Reduction Report*, February 2022. https://static1.squarespace.com/static/5dc5869672cac01e07a8d14d/t/62a9d33e5b80b358fd3441e0/1655296838545/FCS+APF+Recommendation-Technical+Emissions+Report_June+2022.pdf
[19] Agriculture and Agri-Food Canada, *Discussion Document: Reducing emissions arising from the application of fertilizer in Canada's agriculture sector*, last modified March 4, 2022. https://agriculture.canada.ca/en/department/transparency/public-opinion-research-consultations/share-ideas-fertilizer-emissions-reduction-target/discussion.
[20] Statistics Canada, *Land use*, Census of Agriculture, 2022.
[21] COTA. *Quick Facts About Organic in Canada*, 2022.

- This would exceed Canada's fertilizer emissions reduction target by about 24% (achieving 123.75% of the target).

Pesticide Use

Tripling organic cropland in Canada would **reduce synthetic pesticide use by approximately 1.82 million kilograms of active ingredient (a.i.) per year**—equivalent to a 1.97% reduction in total agricultural pesticide use.

We estimate average pesticide use on Canadian cropland to be 2.35 kg a.i./ha.[22] Based on 2016 Statistics Canada data, weighted by usage frequency across herbicides, insecticides, and fungicides, non-organic farms apply pesticides at 5.18 times the rate of organic farms.[23] Organic farms use only pest control products approved for organic production, which differ in type and toxicity from synthetic pesticides. We estimate average pesticide use on organic farms at 2.35 kg/ha divided by 5.18, or approximately 0.454 kg/ha.

Tripling Organic Cropland Scenario

- Cropland to be converted to organic (under tripling scenario): 957,803 ha
- Reduction in pesticide use per hectare: 2.35 kg/ha - 0.454 kg/ha = 1.896 kg/ha/year
- Total pesticide reduction: 957,803 ha × 1.896 kg/ha = 1,815,995 kg/year (≈ 1,816 tonnes/year)
- Total agricultural pesticide use in 2022: 92,245,950 kg active ingredient (a.i.)
- Tripling organic cropland would reduce agricultural pesticide use by: (1,815,995 / 92,245,950) × 100 = **1.97%**

25% Organic Farmland Scenario

- Total cropland in Canada: 37,876,632 ha[24]
- 25% organic = 9,469,158 ha
- Increase in organic cropland from current levels: 9,469,158 ha - 496,416 ha = 8,972,742 ha[25]
- Total pesticide reduction: 8,972,742 ha × 1.896 kg/ha = 17,012,319 kg/year (≈ 17,012 tonnes/year)
- Expanding organic production to 25% of cropland would reduce total agricultural pesticide use by: (17,012,319 / 92,245,950) × 100 = 18.4%

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[22] 2.35 kg/ha represents a midpoint between key reference years and sources: the Canadian average rate for agricultural use in 2016 was 2.35 kg/ha, increasing to 2.54 kg/ha by 2022 according to FAO data; meanwhile, the Fraser Institute estimated Canada's average between 2010-2019 at 2.05 kg/ha. See: FAO, *FAOSTAT: Pesticides Use*, accessed July 2025, https://www.fao.org/faostat/en/#data/RP; Fraser Institute, *Environmental Ranking for Canada and the OECD: Third Edition* (Vancouver: Fraser Institute, April 2023), https://www.fraserinstitute.org/sites/default/files/environmental-ranking-for-canada-and-the-oecd-3rd-edition.pdf.

[23] Statistics Canada, *Selected variables among crop-growing farm types classified by custom total farm area and organic production status*, Canada and provinces, from the 2021 Census of Agriculture.

[24] Statistics Canada, *Land use*, Census of Agriculture, 2022.

[25] COTA. *Quick Facts About Organic in Canada*, 2022.

Import Displacement

Tripling organic production would **strengthen Canada's ability to meet domestic and global demand**, helping farmers capture a larger share of the market, reduce reliance on imports, and increase exports. Although limited data prevents a precise estimate of current domestic organic market share or potential gains, this is a key area for future analysis.

Canada tracks only a portion of organic trade data (primarily horticultural crops for imports) but what is available indicates an organic food trade deficit in 2022.[26]

Among the crops included in this report, carrots, lettuce, spinach, and apples are major organic imports. In contrast, domestic production of potatoes and blueberries already far exceeds imports.[27] Table 8 estimates current organic production using 2022 acreage data and yield coefficients, and compares it with 2022 import data, illustrating the extent to which increased domestic production could displace imports under the tripling scenario.

Table 8: Potential for Import Displacement in Select Tracked Imported Organic Products[28]

Crop	Organic import quantity, 2022 (kg)	Organic import value, 2022 ($)	Organic production, 2022 (kg)	Organic production with tripled acreage (kg)	Import displacement with tripling, quantity (kg)	Import displacement with tripling, value ($)	% of imports displaced
Apples	12,470,312	34,357,408	1,003,569	2,609,279	1,605,710	4,423,951	13%
Blueberries	5,107,324	46,011,590	25,304,806	65,792,496	5,107,324	46,011,590	100%
Carrots	17,497,877	34,317,190	812,820	2,113,332	1,300,512	2,550,590	7%
Lettuce	8,886,187	50,961,042	124,702	324,224	199,522	1,144,233	2%
Potatoes	4,114,000	6,018,528	26,593,400	69,142,840	4,114,000	6,018,528	100%
Spinach	6,255,712	40,786,083	45,657	118,708	73,051	476,280	1%

[26] COTA. *Quick Facts About Organic in Canada*, 2022.
[27] Statistics Canada. Canadian Certified Organic Imports - Value and Quantity, 2022. https://www150.statcan.gc.ca/n1/pub/71-607-x/71-607-x2021004-eng.htm.
[28] Sources for Table 8: Canadian Certified Organic Imports - Value and Quantity, 2022. https://www150.statcan.gc.ca/n1/pub/71-607-x/71-607-x2021004-eng.htm; COTA. *Quick Facts About Organic in Canada*, 2022; see Appendix 2 below for detailed methods on calculating crop emissions.

Appendix: Methods for calculating crop production and emissions

This section is drawn from Appendix 2: Environmental Impacts Technical Report, Report 2.3: Organic Agriculture and Climate Change Mitigation in Canada

Emissions estimates were calculated as the product of production amounts and the carbon intensities (CO_2e/kg produced). The conventional area of production for each crop was calculated using the Statistics Canada reported 2021-2023 seed area (or cultivated area) less the area of organic production reported by organic certifiers, compiled by the Canada Organic Trade Association (Government of Canada, 2024b, 2024a, 2024c). The conventional production amount per crop was calculated by multiplying this amount by Canada's 2021-2023 yield data (Government of Canada, 2024b, 2024a, 2024c). Organic production volumes were estimated as the product of the organic crop areas, the Statistics Canada yield data, and the relative changes in yield associated with organic production reported in Boschiero et al. (2023). All production estimates were transformed to a per-unit dry matter basis using per-crop dry matter data reported in a repository of crop LCAs (Poore, 2018; Poore & Nemecek, 2018).

Current conventional emissions were estimated as the product of total conventional production by crop and the Agriculture and Agri-Food Canada (AAFC) crop emissions factors reported by Clearwater et al. (2016). Current organic emissions were estimated as the product of total organic production, the AAFC crop emissions factors reported by Clearwater et al. (2016), and the relative change in emissions per crop reported by Boschiero et al. (2023). Clearwater et al. (2016) do not provide emissions intensity estimates for all crops. In such cases, the average of conventional LCA meta-analysis data from Poore & Nemecek (2018) was used after the data was filtered to Canada, the United States, and Europe.

Changes in emissions for a theoretical expansion of organic agriculture were calculated using the same calculations above but with increases in organic acreage (e.g. a three-fold increase) accompanied by the appropriate reduction in conventional acreage

Further explanations

Organic yield changes for pea, lentil, chickpea, flaxseed, canola, rye, spinach and blueberry were not individually reported in Boschiero et al. (2023). Thus, the general legume category was instead used for the legume crops. The average crop yield change (24% reduction in yield for organics) reported by Boschiero et al. (2023) was used for flaxseed, canola, rye, and spinach. No yield changes were assumed for the organic production of blueberries as reported in Montalba et al. (2019).

Spinach, blueberry, apple, and flaxseed dry matter contents were not reported in the Poore and Nemecek (2018) database. Instead, the respective dry matter values reported by Kunicki et al. (2010), Gonçalves (2015), Gebhardt and Thomas (2002), and Bozan and Temelli (2008) were used. Poore and Nemeck did not provide an emissions factor for conventional spinach. LCA data from Lin et al. (2024) was used instead.

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