

Agricultural Adaptation

Soil is the Root of the Issue

Paul Thoroughgood P.Ag



SOIL CONSERVATION COUNCIL OF CANADA
CONSEIL CANADIEN DE CONSERVATION DES SOLS

*The face and voice of soil conservation in Canada
Le visage et la voix de la conservation des sols au Canada*



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Adaptation is not new for Agriculture

- You can't control the weather!
- Price takers coming and going
- The role of technology



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Examples of Recent/Ongoing Adaptations

- >70% Increase in Productivity



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Changes in Productivity of Canadian Farmland

Canadian Census of Agriculture Data



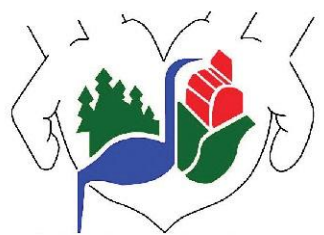
Examples of Recent/Ongoing Adaptations

- >70% Increase in Productivity
- Investments in Alternate Crops



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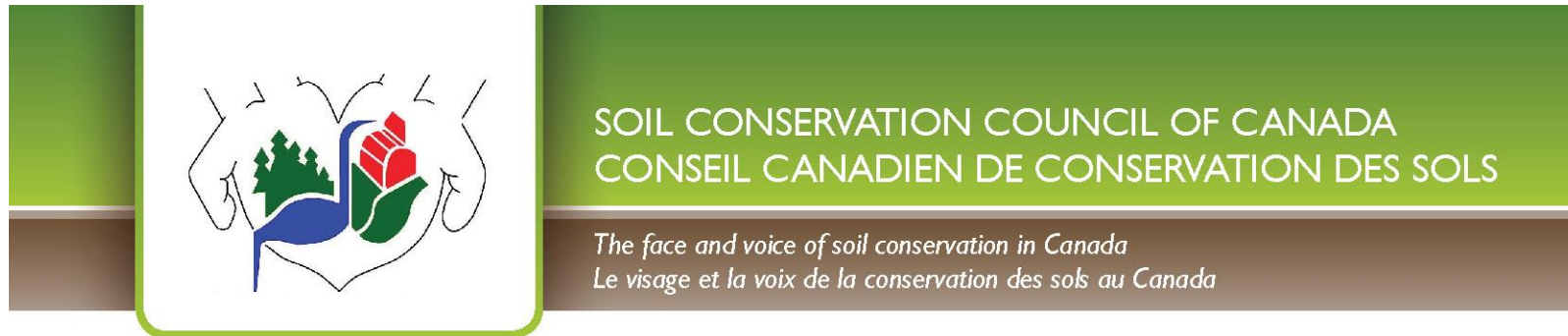


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From a Soil Perspective: What can we influence in our lifetime?

- Mineral Material





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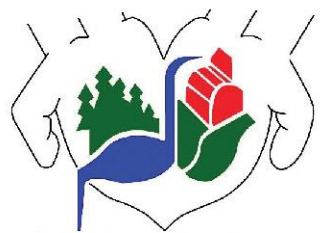
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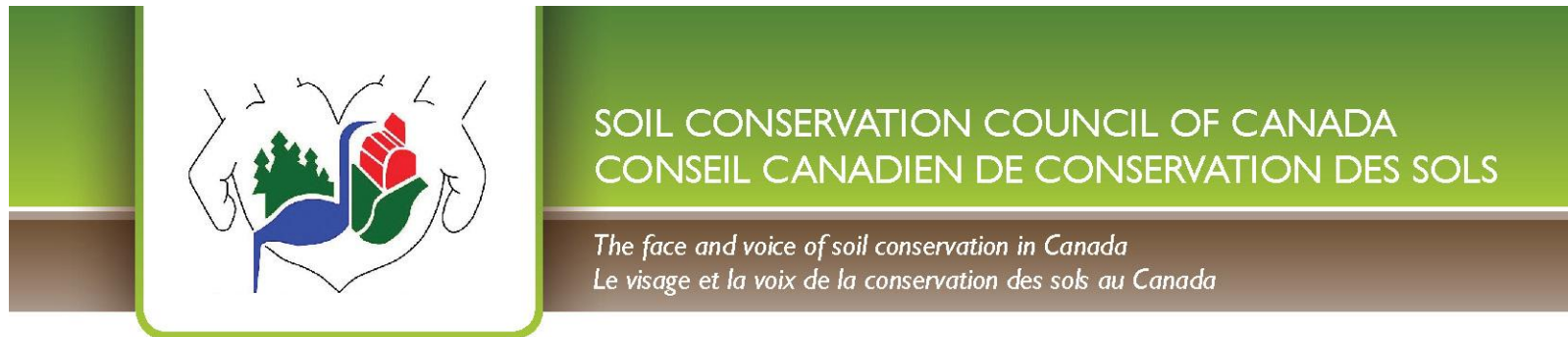


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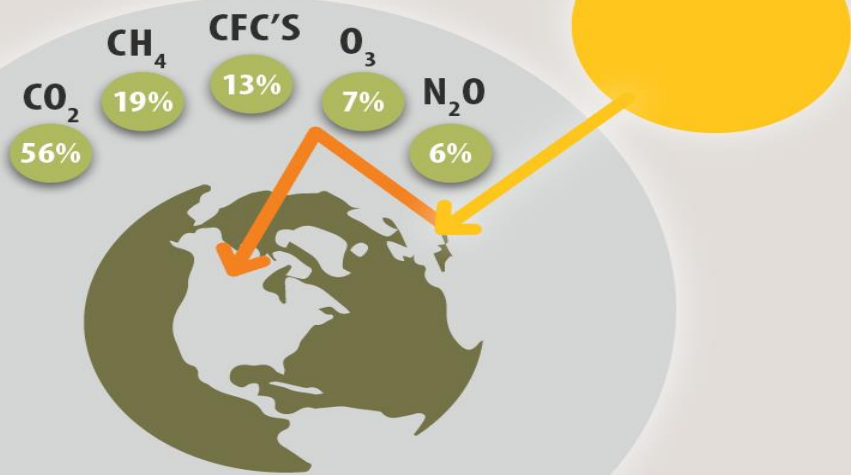
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From a Soil Perspective: What can we influence in our lifetime?

- Mineral Material
- Organic Material



THE IMPORTANT HUMAN-PRODUCED GREENHOUSE GASES



GHG EMISSIONS BY COUNTRY

#9 CANADA

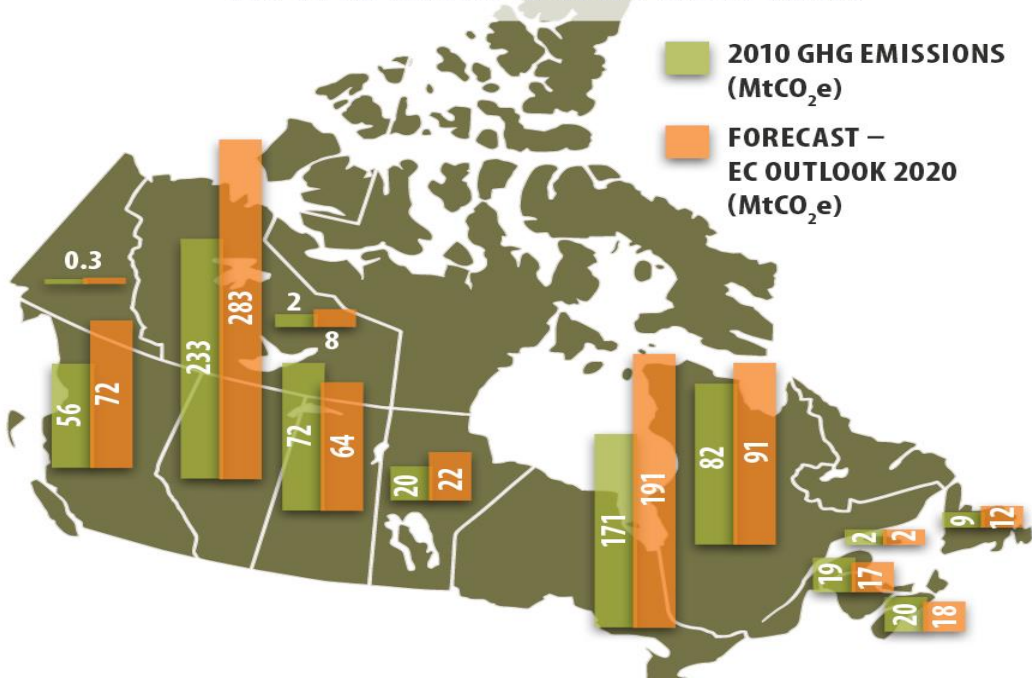
#1 CHINA

#2 U.S.

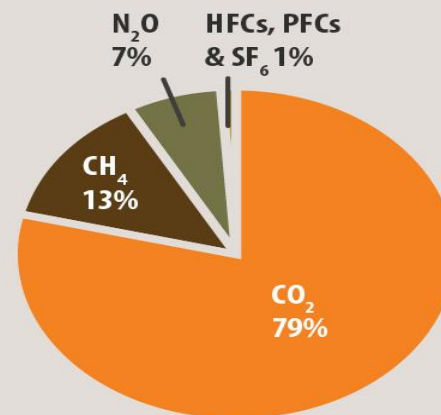
2010



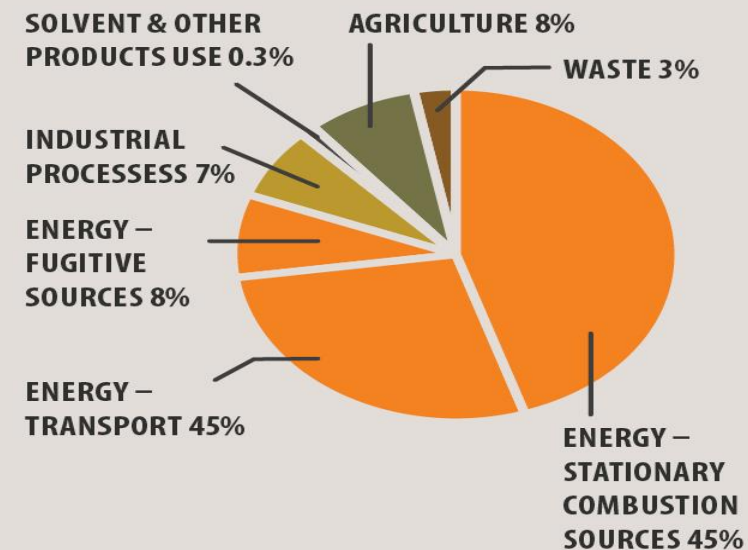
GREENHOUSE GAS EMISSIONS IN THE CANADIAN CONTEXT



CANADA'S TOTAL EMISSIONS BREAKDOWN 2010 BY GREENHOUSE GAS



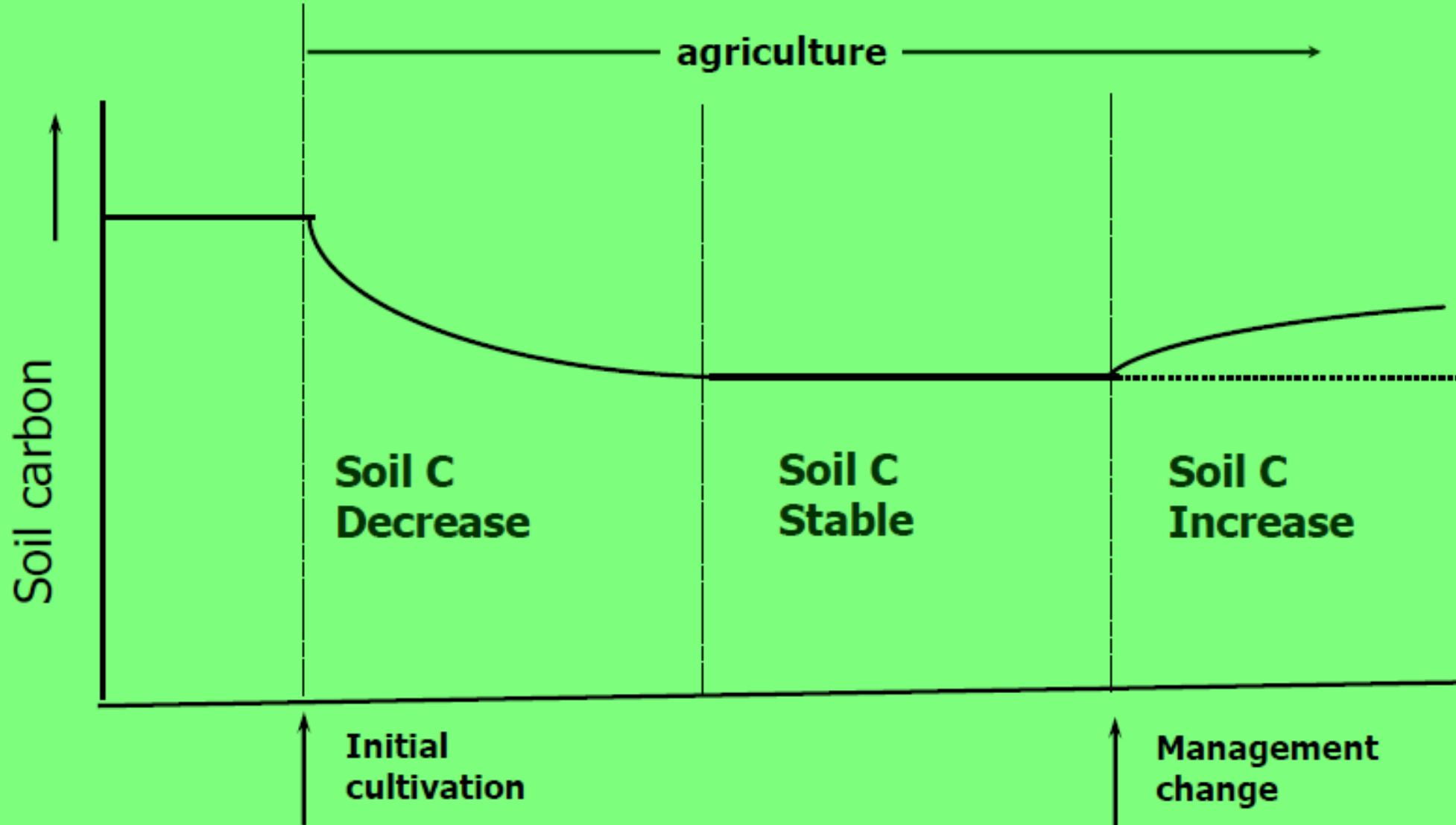
CANADA'S EMISSIONS BREAKDOWN 2010 BY IPCC SECTOR

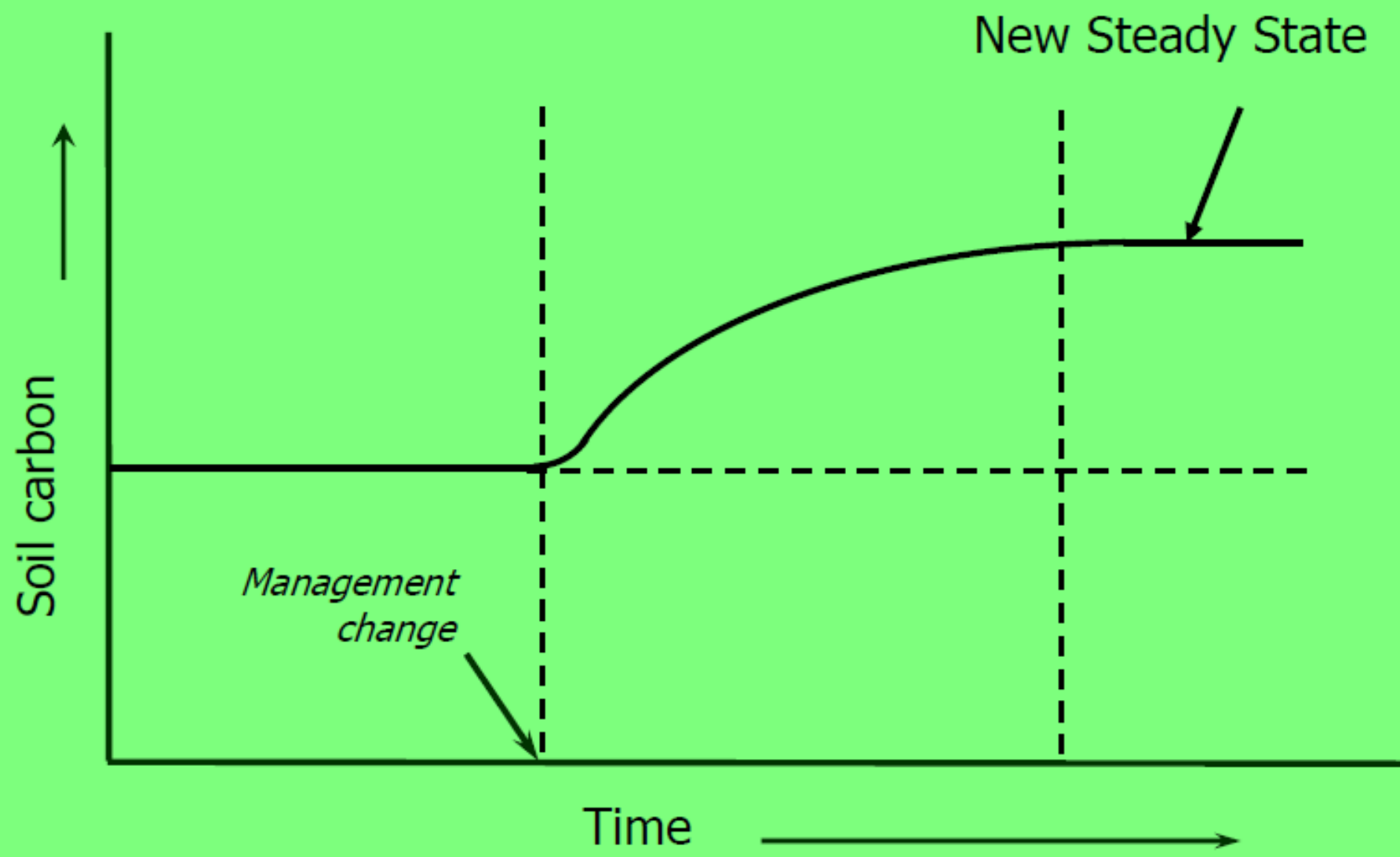


Effect on
atmospheric
CO₂



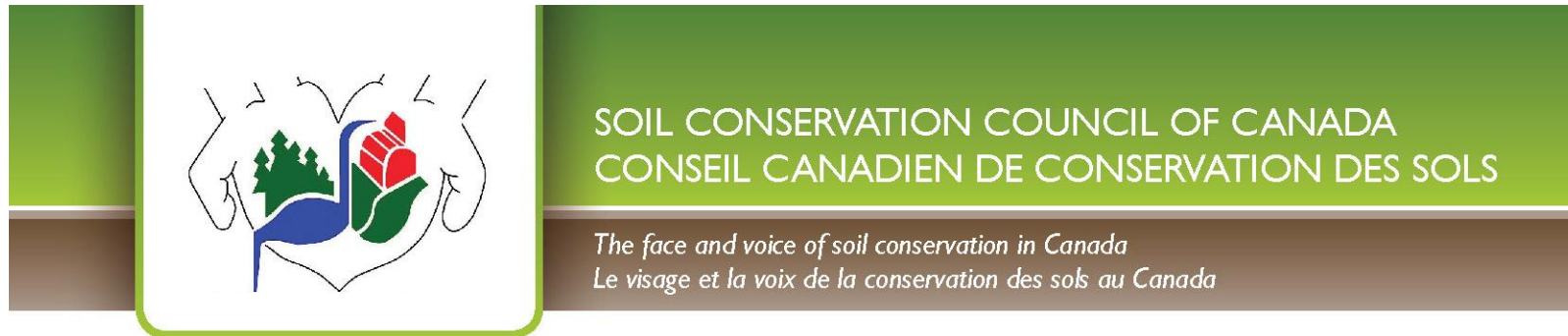
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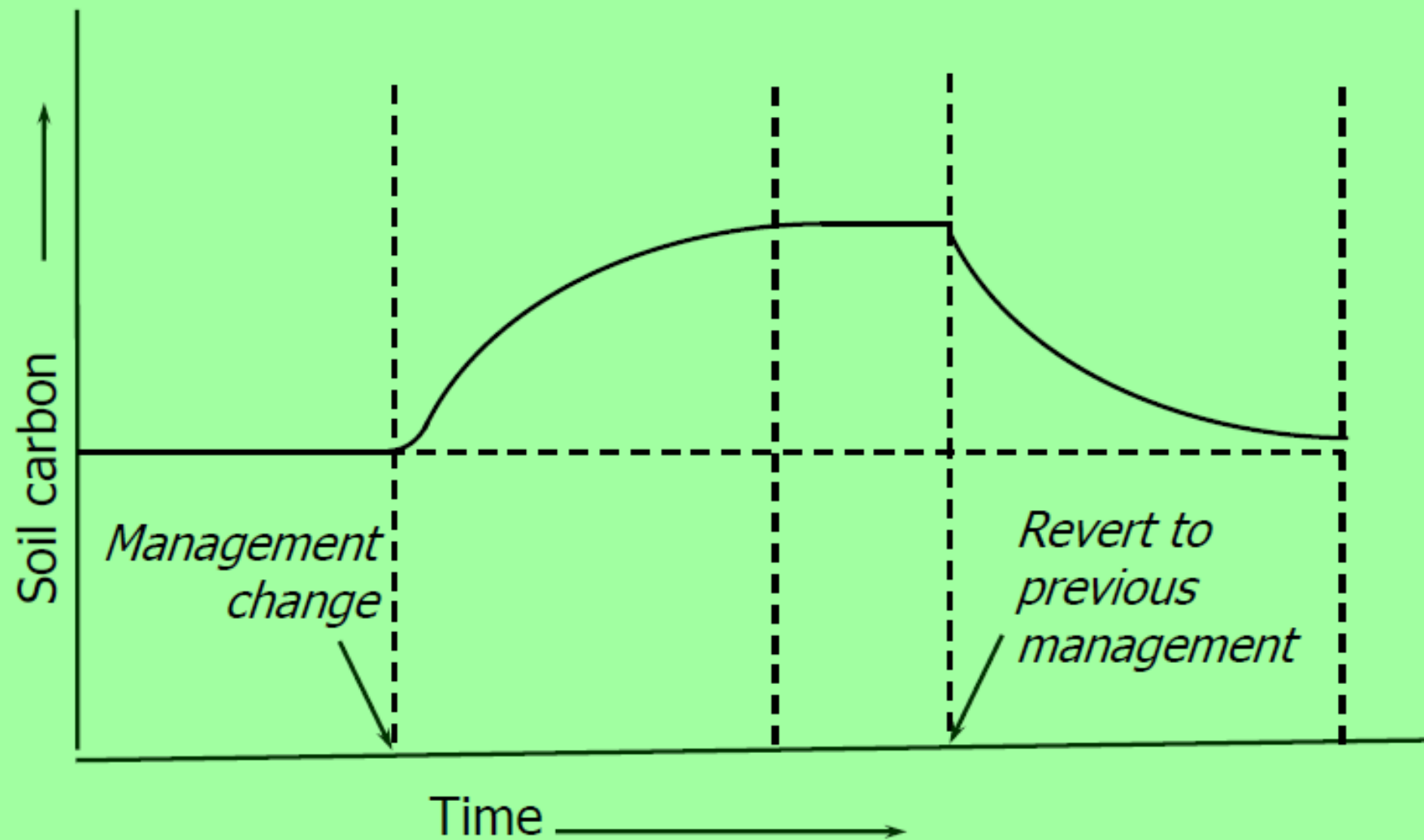


Soil Organic Carbon (SOC) research conducted by Dr Brian McConkey (AAFC)

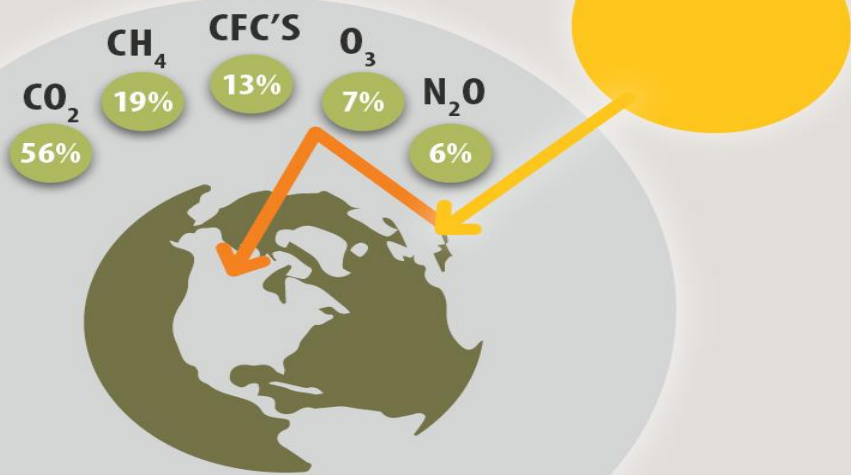
- Under no-till management
 - Increasing SOC at all depths to 40 cm
 - Saskatchewan farmland increasing SOC 0.23 Mg C/ha/yr or 0.38 ton CO²/ac/yr



C sequestration is reversible



THE IMPORTANT HUMAN-PRODUCED GREENHOUSE GASES



GHG EMISSIONS BY COUNTRY

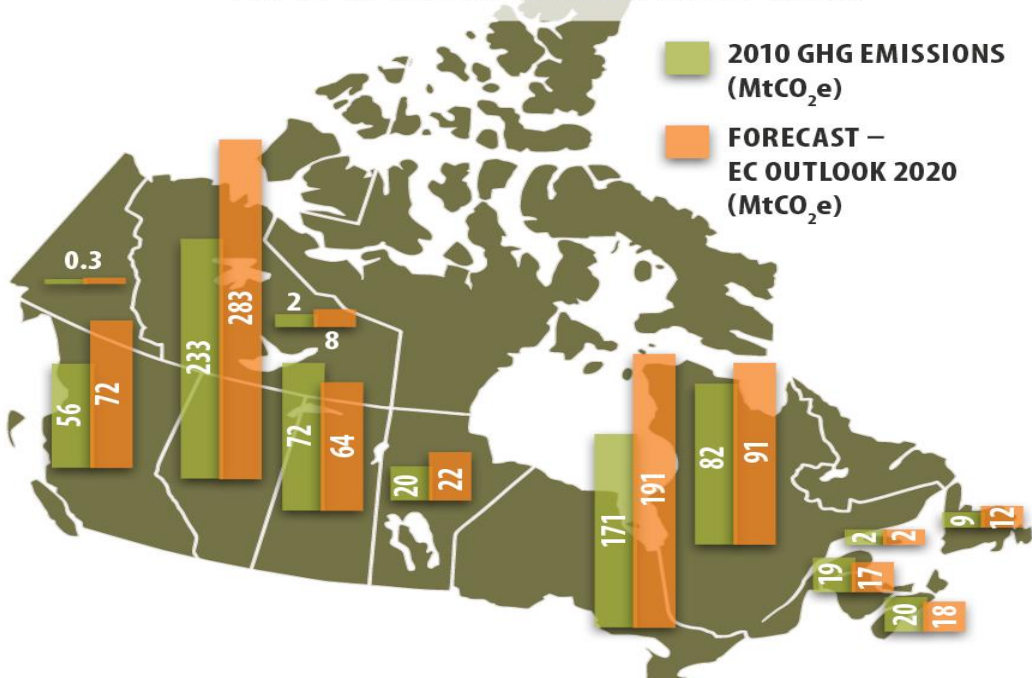
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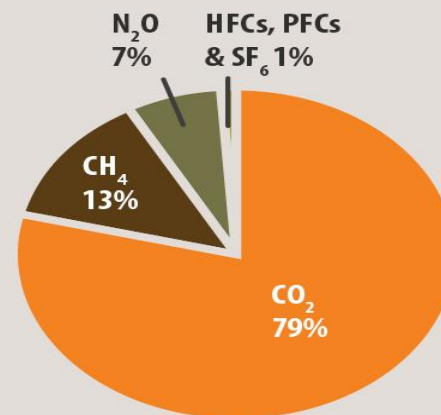
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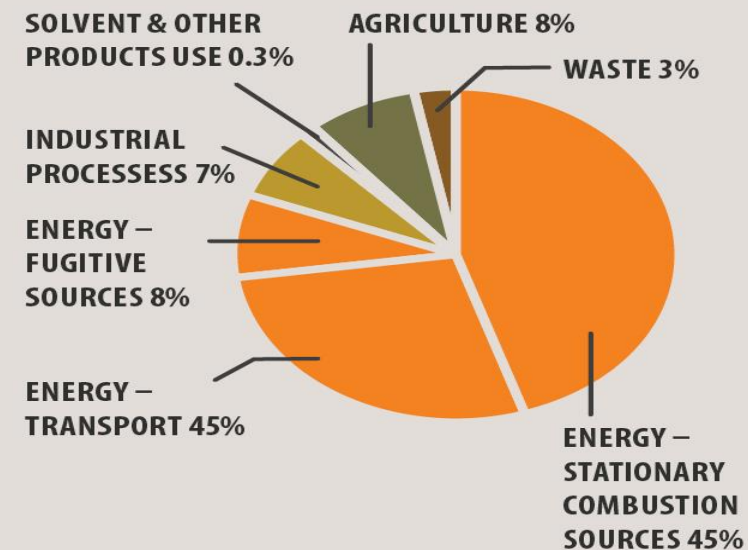
GREENHOUSE GAS EMISSIONS IN THE CANADIAN CONTEXT

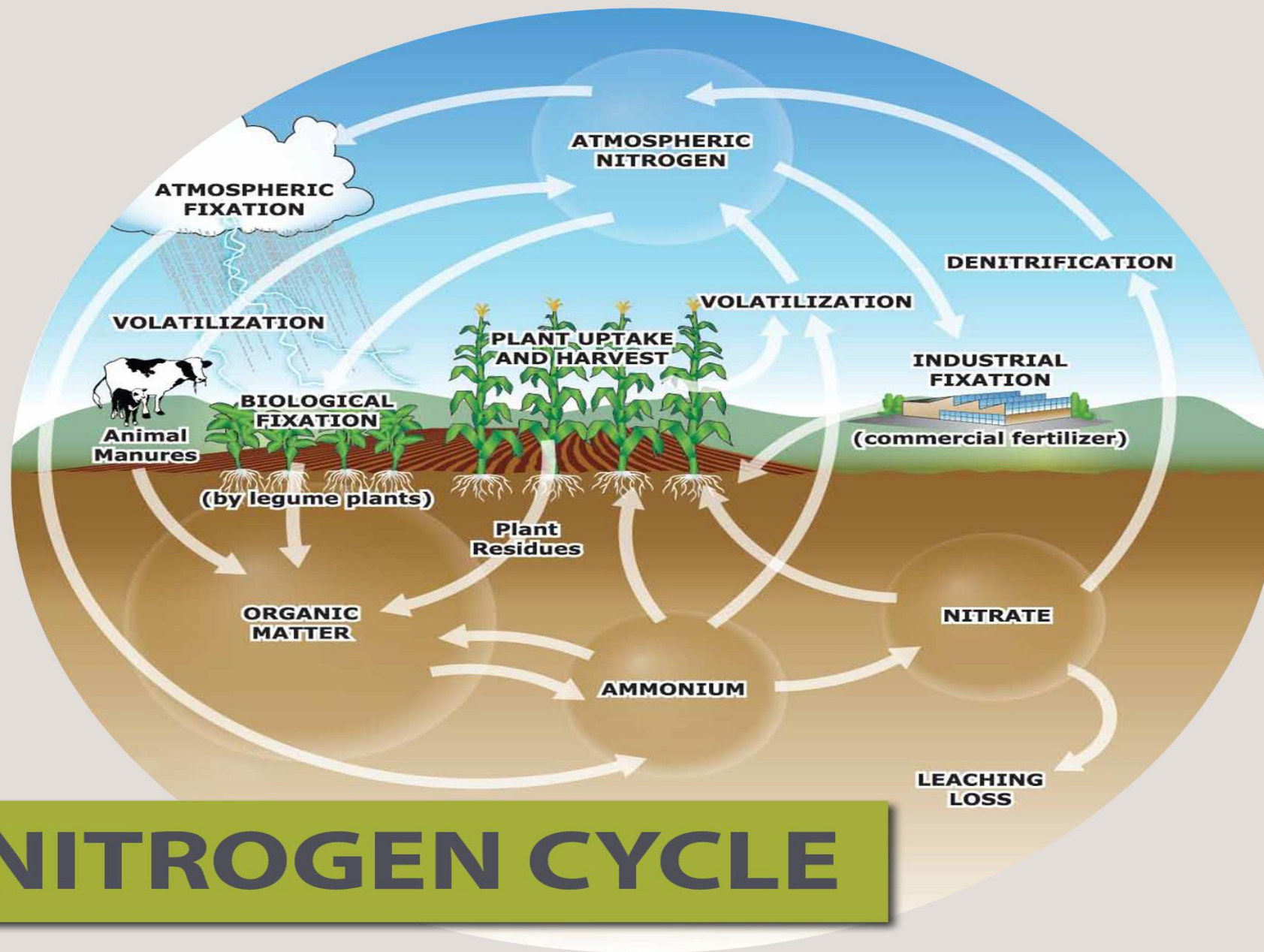


CANADA'S TOTAL EMISSIONS BREAKDOWN 2010 BY GREENHOUSE GAS



CANADA'S EMISSIONS BREAKDOWN 2010 BY IPCC SECTOR





THE NITROGEN CYCLE

THE 4RS

RIGHT

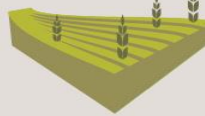
SOURCE

RIGHT

RATE

RIGHT

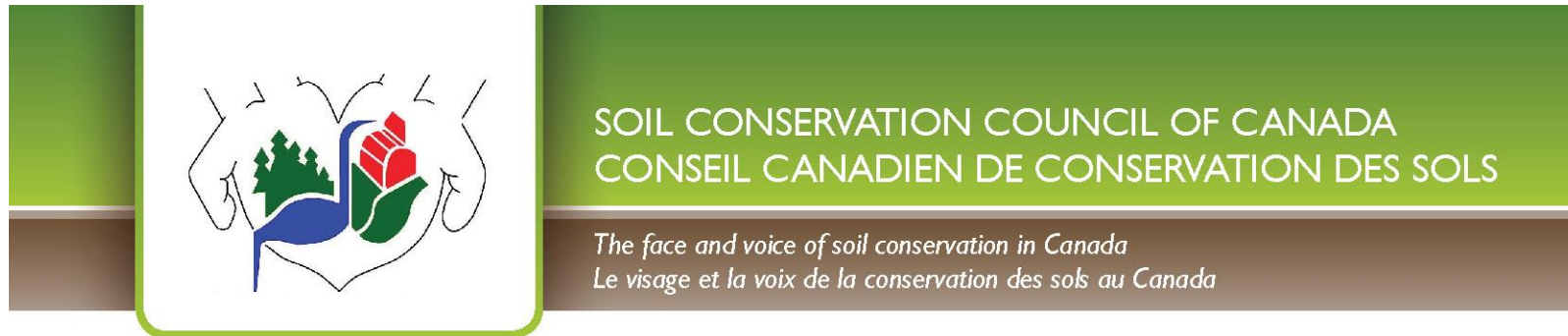
TIME

RIGHT

PLACE



Nitrous Oxide Emission Reduction Protocol

- Sustainable Intensification
- 15 to 25% Reduction
- Possibly 2X with new science
- Reduced risk of nitrate accumulation





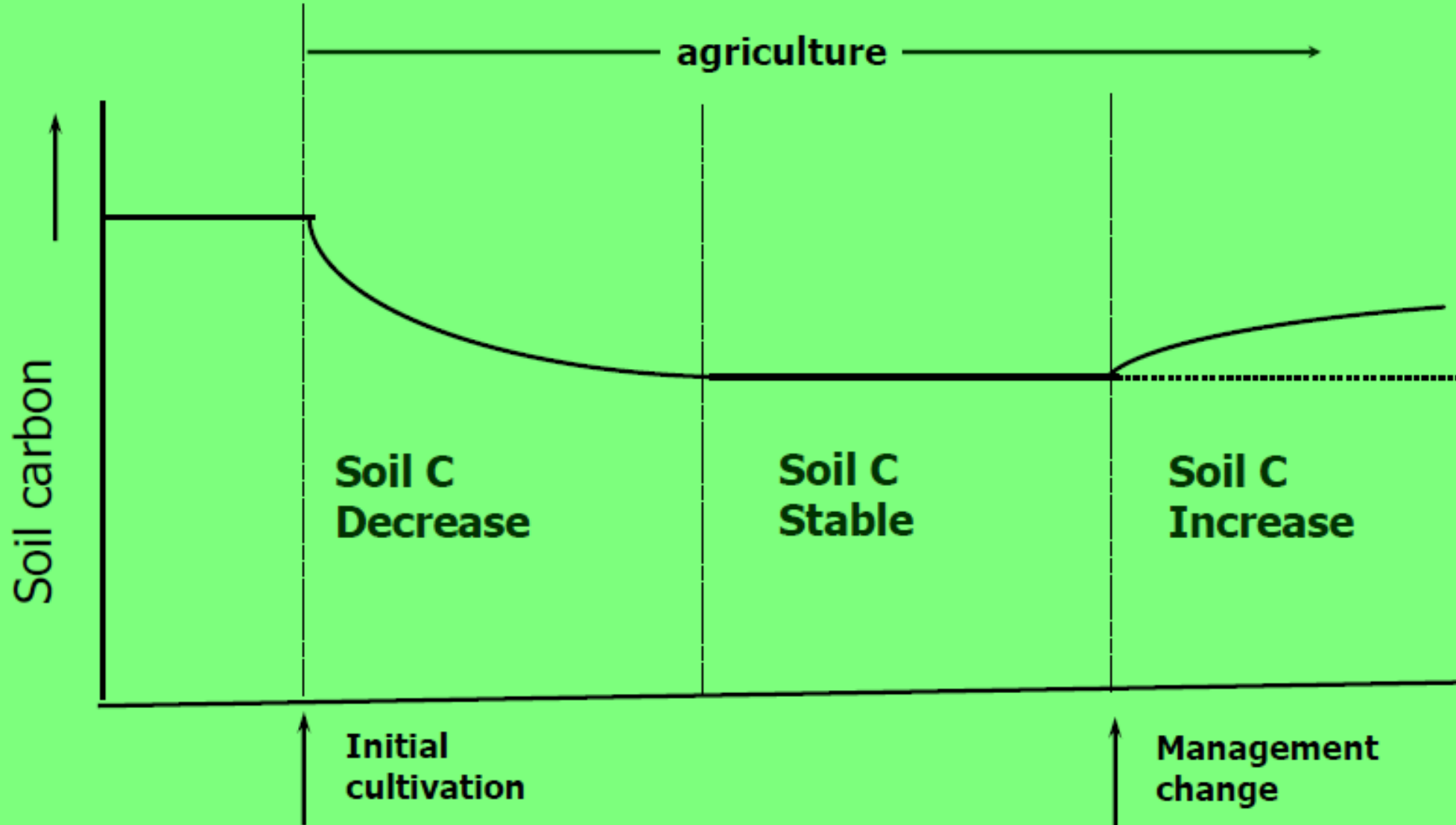
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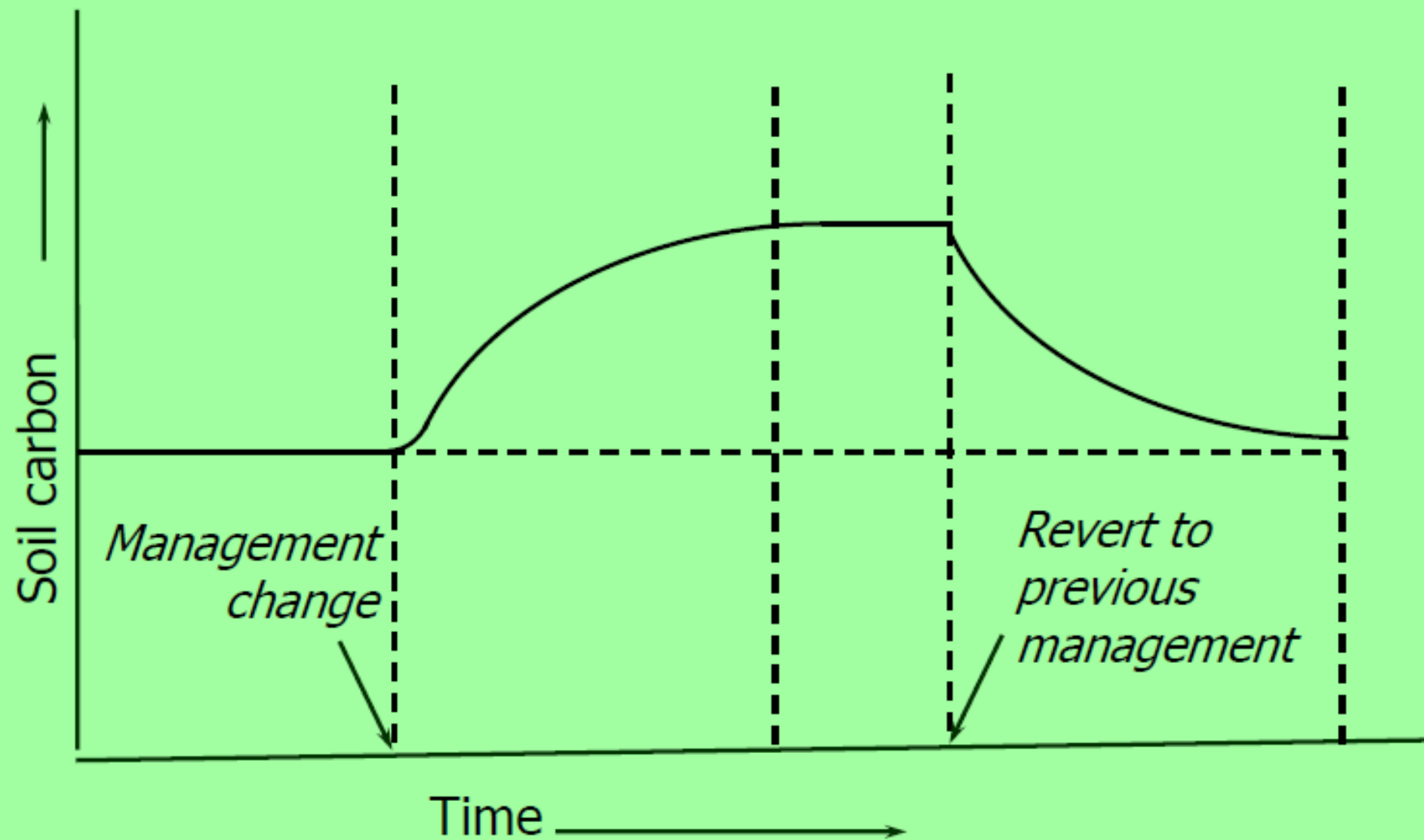
Effect on
atmospheric
CO₂



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C sequestration is reversible



Agriculture IS PART OF THE SOLUTION

- SOC Sink
- No-Till on 100% of Farmland
 - @ 28 MT CO²
- 4R Nutrient Stewardship on 100% of Farmland
 - @ 10 MT CO²
- 2M People
- 6M Cars



THANK YOU!

SOILCC.CA

