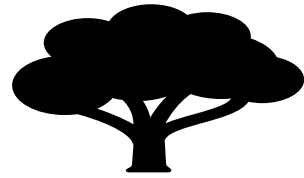




Climate Change and the Ontario Maple Syrup Products Sector

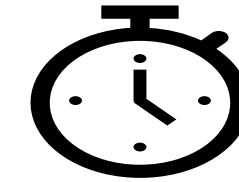
Ontario Maple Producers' Association
Climate Change Working Group

Increasing evidence on effects of climate change – 1 of 2



Sugarbush Health

- Warmer and longer growing seasons can potentially **benefit tree growth** if properly managed
- Potential for higher frequency of native **pest outbreaks** and exotic pest invasion
- **Increased drought frequency and severity** can cause widespread seedling mortality, hinder root performance and growth
- **More frequent spring frosts** coincide with vulnerable budbreak period, causing leaf dieback, delaying canopy development
- **Reduced winter snowpack** and more winter precipitation falling as rain, leading to fine root damage



Maple Season Timing

- **Tapping seasons are beginning earlier** and becoming more unpredictable
- The **timing of last boils** is being more affected more than timing of first boils
- **Buddy sap will appear earlier** and more unpredictably
- **Very short syrup production seasons** will likely become more frequent
- Shifting and unpredictable tapping seasons is having **implications for labour availability**

Increasing evidence on effects of climate change – 2 of 2



Geography

- **Sugar maple habitat will shrink in its southern range** while potentially growing in northern regions
- **Southerly latitudes will experience fewer days favourable for maple syrup production**, while northerly latitudes will experience more
- The rate of tree migration may not keep pace with climate change, but it **may take decades for currently existing trees to decline and be replaced.**



Market Effects

- **Carbon taxes will increase the cost of fuel**; you may need to invest in new technologies to stay competitive
- **Consumers are more likely to choose eco-friendly products** which means organic or environmentally sustainable labelling will be increasingly popular

Many producers are already reporting the effects

Key takeaways from producer surveys



- Most producers believe that quantity and quality of sap is decreasing due to climate change
- 1/3 of producers missed the first sap flow of the season several years in a row
- 40% of producers believe that severe weather events will have a negative impact on syrup production

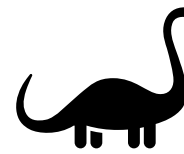
Legault S, Houle D, Plouffe A, Ameztegui A, Kuehn D, Chase L, et al. (2019) Perceptions of U.S. and Canadian maple syrup producers toward climate change, its impacts, and potential adaptation measures. PLoS ONE 14(4): e0215511

How are Other Maple Syrup Associations Responding?



Quebec

- Legislation protects sugarbushes leased on public land from deforestation
- 1100 certified organic producers have Carbo-neutre branding available to them – no uptake so far
- Government funding research on the impact of climate change on maple syrup production
- Forestry association launched PIVOT program to provide carbon credits to woodlot owners



Vermont & USA

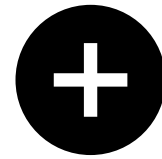
- No specific climate action being taken by maple syrup producers
- Proctor Research Center has focused primarily on increasing yields via technology
- Cornell University actively studying impact of climate change on maple syrup production in USA



Rest of Canada

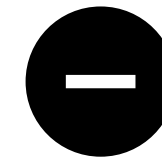
- Nova Scotia Maple Syrup Producers Association has highlighted the risks of climate change to producers for several years but has not taken any other action
- No specific climate action being taken by maple syrup producer associations in other Canadian provinces

Ontario – Strengths & Weaknesses



Strengths

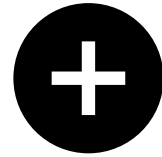
- Emerging research reveals that many efficient maple syrup producers are carbon neutral
 - More to come ... work in progress
- Good relationship with the Ontario Woodlot Owners Association (OWA) which is actively working on a carbon credit program for community forests and private woodlot owners
- OMSPA is sole group representing maple syrup producers in Ontario



Weaknesses

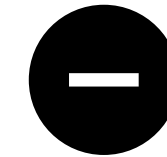
- Most Ontario maple syrup producers are small-to-mid-sized and produce maple syrup to supplement other income – not well represented by OMSPA
 - Large producers skeptical about achieving net-zero production due to scale (not necessarily true)
 - Smaller producers tend to think their activities are too small to matter (overlooks opportunity to have combined impact)
- Technical challenges need to be overcome for maple syrup producers to benefit from carbon credits
 - No existing approved methodology for carbon credits that can be used by maple syrup producers
 - Carbon tax rebate likely to be easier to obtain

Ontario – Opportunities & Threats



Opportunities

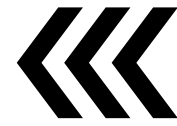
- Climate-negative maple syrup certification could be used as a basis for obtaining carbon tax rebates, or carbon credits for members
- Consumers are increasingly drawn to eco-friendly products which means environmentally sustainable labelling will be increasingly popular
 - Climate-friendly maple syrup could promote eco-tourism in Ontario
 - A net-zero GHG maple syrup branding program can improve market preference for Ontario syrup
- Potential increase in buddy sap could mean market expansion to new areas
- Enabling reuse of bottles for maple syrup would help members significantly reduce packaging cost as well as indirect emissions



Threats

- Maple syrup production could become increasingly infeasible in southern Ontario over time
- Climate action is accelerating in all sectors and OMSPA's opportunities may be overtaken by others unless OMSPA fast-tracks its response
 - Forest Certification Program is exploring net-zero certification for maple syrup
 - EcoCert has a net-zero branding program for organic producers in Quebec that might be expanded

Recommended Options for Action



Member-Focused

- Implement awareness program on impact of climate change and mitigation & adaptation opportunities
- Assist members in transitioning / certifying net zero maple syrup transition
 - Explore potential for gov subsidies
- Enhance the value of OMSPA membership via carbon tax rebates and other tax benefits
 - Potentially could improve member income by 3% in 2022 rising to 10% by 2030



Outreach-Focused

- Strong public messaging about OMSPA's climate action initiatives
 - Raise consumer awareness of Ont Maple Syrup being eco-friendly
- Partner with eco-tourism industry
- Standardize carbon accounting practices for maple syrup to accelerate government recognition and financial support for transition

Supplementary Recommendations



Regulatory

- Permit maple syrup to be sold in re-usable glass bottles
 - Reduces producer costs by 5 – 8%
 - Reduces indirect emissions from CO₂ used to make new glass bottles (made mostly in China were there is no use of recycled glass)
- Introduce regulations on standardizing and measuring evaporator efficiency
 - Few wood evaporators are > 30% efficient
 - Similar to EnerPlus designation on home appliances
- Require carbon disclosure on all products sold to the agriculture industry
 - E.G. How much CO₂ per metre of pipeline?



Research & Development

- Carbon tax credit methodology suitable for use by maple syrup producers
- Models for forecasting optimal sap flow conditions to enable producers to better predict the start / end of the changing seasons
- Improved biomass equations for estimating carbon sequestration in managed sugarbushes
- Silvicultural practices that better protect maples from a changing climate
- Deeper research into the effect of a warming climate on brix levels in sap and potential mitigation measures

There are things we can do today

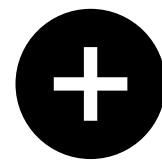
Reduce fuel consumption, carbon footprint, and costs by:

- ✓ Improving heat management in your evaporator
- ✓ Reducing amount of sap needed to boil by investing in RO technology
- ✓ Use electric powered UTVs, chainsaws, etc. to reduce use of secondary fuels
- ✓ Consider using suppliers and shippers with lower carbon-emissions

Minimize risk and improve carbon sequestration by:

- ✓ Implementing OMPSA best practices for sugarbush management including promoting biodiversity which can mitigate risk of wind damage and invasive species
- ✓ Consider harvesting only dead, diseased, or downed trees for firewood where possible and allowing healthy trees to grow and sequester carbon
- ✓ Use pipelines with improved sanitation to avoid missing the start of the season by tapping earlier

Maple Syrup Producers Have An Advantage

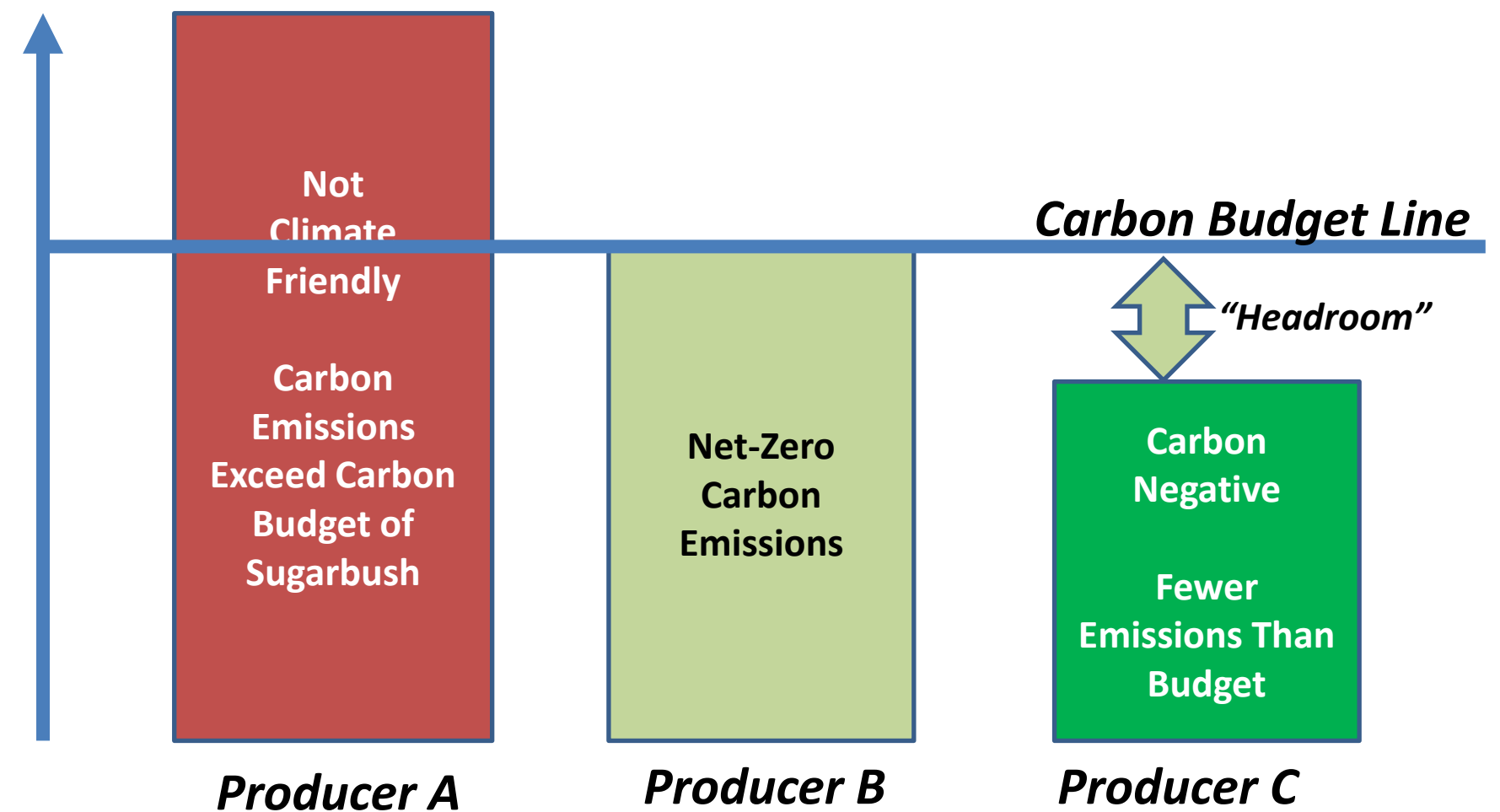


Sequestration

- Sugar bushes capture carbon naturally
 - Lots of it (14 - 20 kg per mature tree per year)
- Even 100 small, but tappable, maple trees sequester over 1 tonne of CO2 per year
- The amount of carbon sequestered in your trees creates an annual carbon budget for you to work within
- A producer with 50,000 taps has a carbon budget of over 1 M tonne of CO2 per year
- If you stay within that budget, you are provably carbon friendly (net-zero or carbon negative)

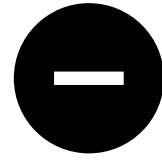
1 Tonne = 1,000 kg or 2200 lbs

*Carbon Storage naturally occurring increases with the number of trees
In the Sugarbush*



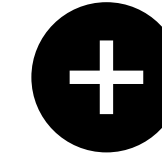
Carbon Emissions Vary By Producer

Many Maple Syrup Producers Are Already Net-Zero



Emissions

- 90% of maple syrup producer emissions come from evaporating sap
 - RO is carbon-friendly because it reduces sap volume without using heat
 - Electric power is much lower emission than from fuel used in evaporator
- The more efficient your evaporator is, the less carbon emissions you have
 - The less efficient your evaporator is, the more you need to use RO to reduce carbon footprint



Examples

- Examples of producers who have provably Net-Zero Green House Gas emissions:
 - Wood Evaporator
 - 1 x 100 – 1,000 Taps
 - 3 x 1,000 – 5,000 Taps
 - 1 x 5,000 – 10,000 Taps
 - Oil Evaporator
 - 1 x 3,000 Taps
 - 1 x 7,500 Taps
 - 1 x 19,000 Taps
 - 1 x 40,000 Taps (in progress)

More to come ... contact Paul Renaud if you would like to participate in a case study

Top 3 Reasons For Becoming Provably Net-Zero

1. Good for the environment

- Ethically responsible
- Enables immediate action on fighting climate change instead of waiting for others

2. Increases efficiency if you are not as efficient as you can be

- Don't like cutting wood, buying so much fuel, ...
- Lowers costs

3. Financial benefits

- Increased sales to climate-conscious customers
- Opportunity to differentiate in a crowded market
- Potential for downstream tax breaks or carbon credits in future