LMC International

The Quebec maple syrup cartel: Dissension in the ranks and opportunities for US producers

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LMC International

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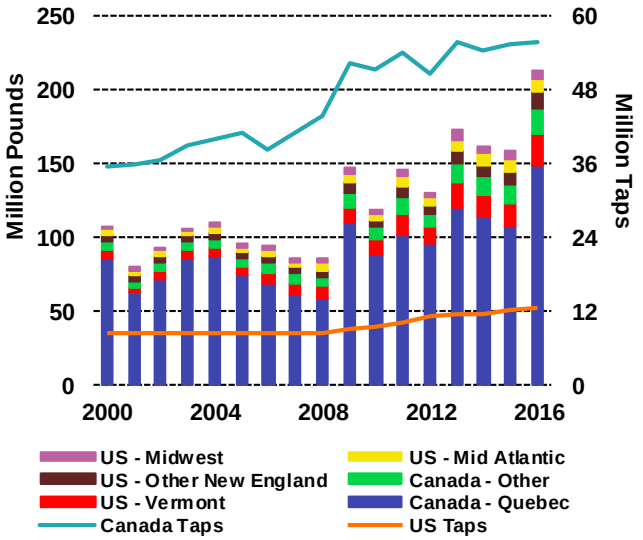
Overview - production

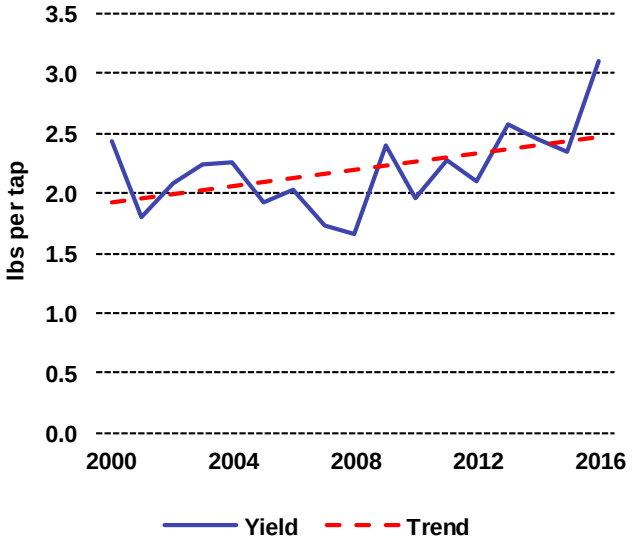
North America is the only place where Maple Syrup is produced commercially

- Grown on a small scale in New Zealand. Birch syrups are produced in Russia and Alaska.
- 2016 maple syrup production was 212 million pounds, breaking previous record by over 20%.
- Why? More taps, technological advancements and a nearly ideal tapping season.
- Despite recent technological advancements, most producers remain small. As of 2012, 50% of Vermont's maple syrup was produced by the largest 2.5% of its operations.

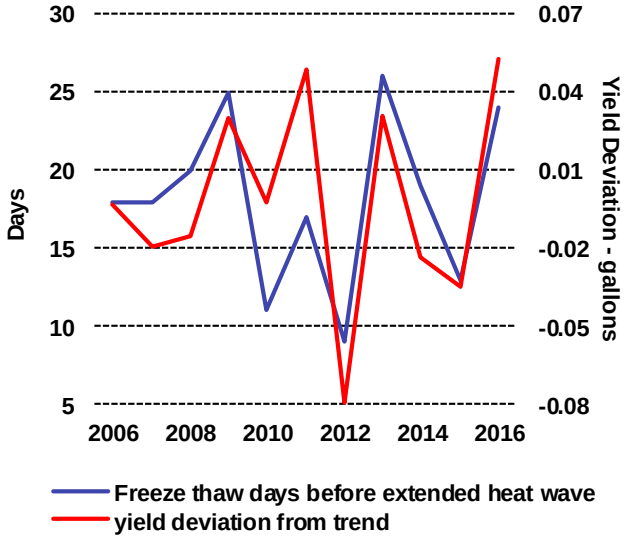
Evolution of North American (global) production and taps



Trends in North American maple syrup yields



Relationship between weather and deviation from trend yield



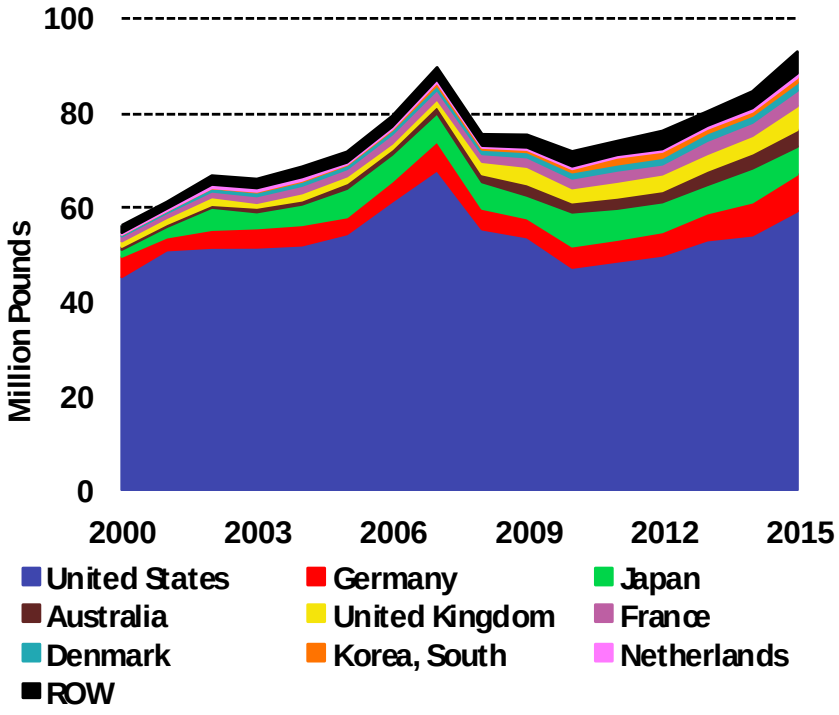
Source: USDA NASS, LMC Analysis.

Overview - consumption

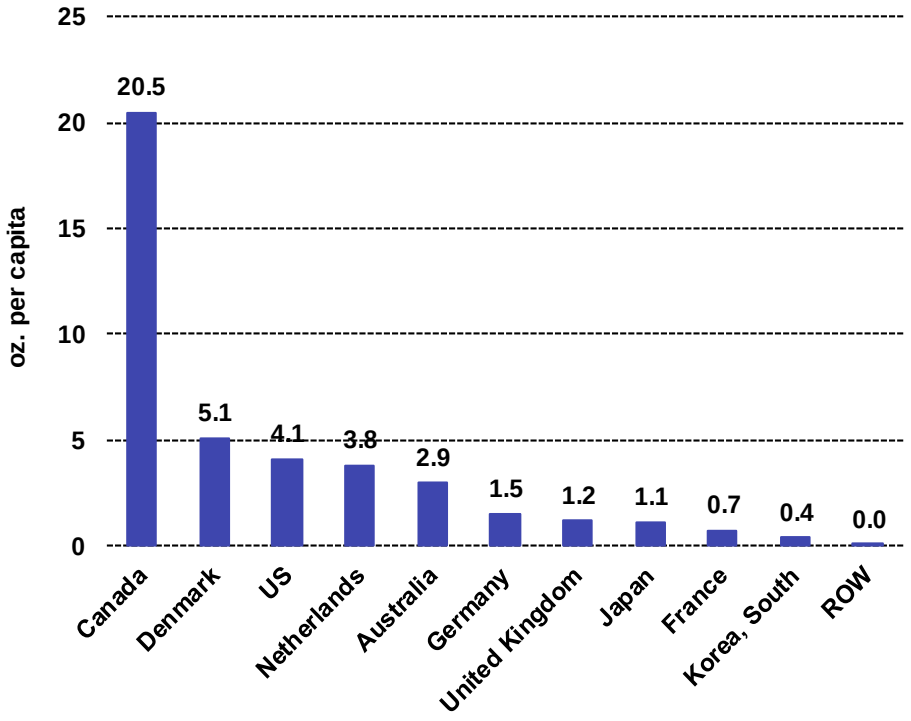
Consumption is concentrated in North America, Japan, Australia and a handful of European countries

- Massive potential for growth – If EU-28 and Japan consumed at per-capita levels in line with the US, production would need to increase 60% from the 2016 record.

Leading importers of Canadian maple syrup



Per-capita maple syrup consumption



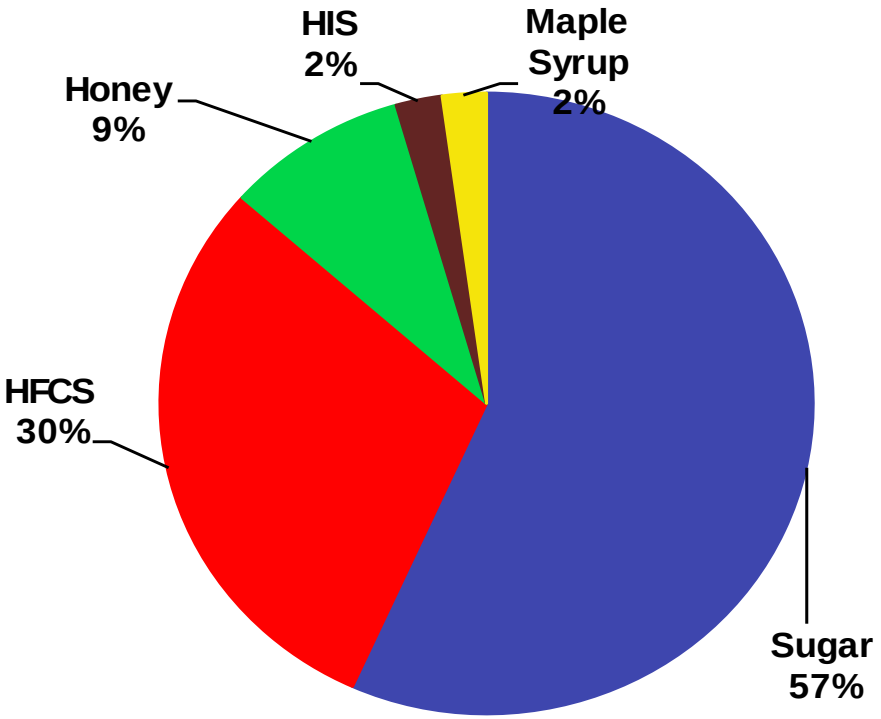
Source: USDA FAS.

Overview - consumption

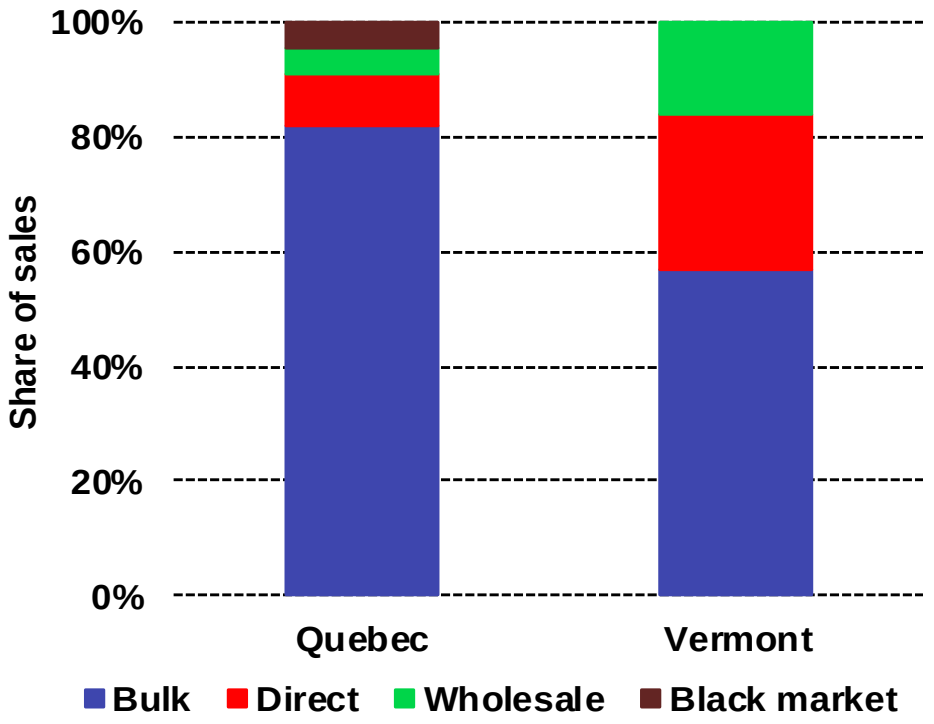
Maple syrup represents a small share of US sweetener consumption by volume but punches above its weight in terms of value.

- More than 1/3rd of US production is sold direct from producer to consumer or grocery store.
- It is estimated that upwards of 5% of Quebec's production is sold on the black market.

US sweetener market share, by value



How maple syrup is marketed in the US and Canada



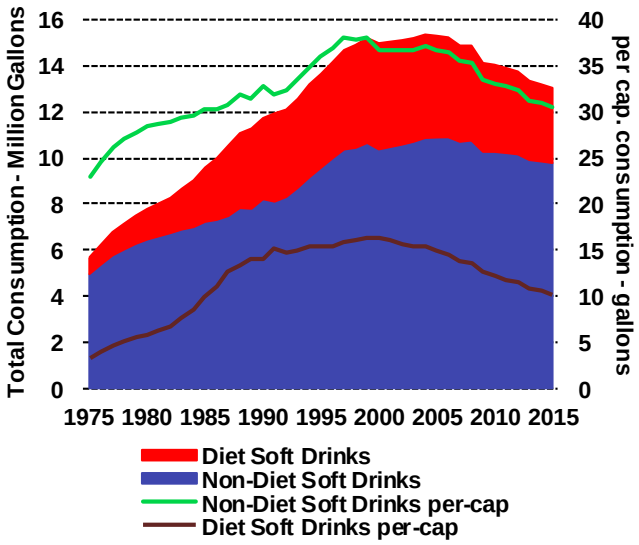
Source: USDA, LMC Analysis, FPAQ, U. of Vermont.

HIS - consumption

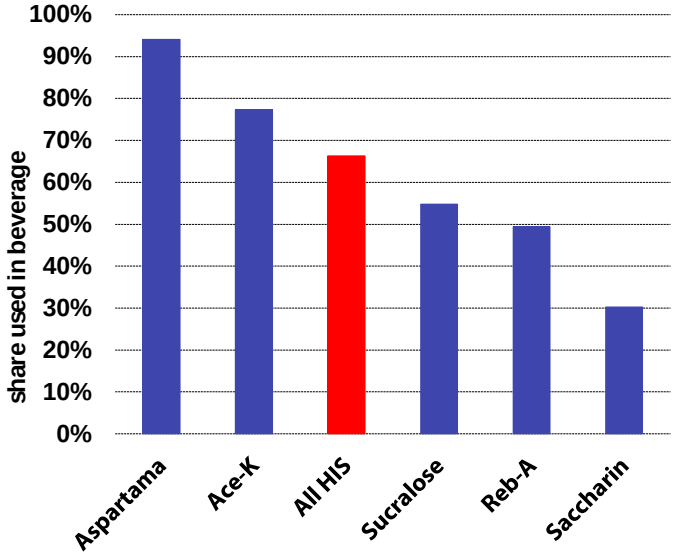
A large share of HIS are still used in diet soft drinks, where consumption has fallen off rapidly

- Roughly 2/3rds of High Intensity Sweeteners are used in diet drinks. Food, table top and pharma share the rest.
- Consumption of diet soft drinks has fallen 38% per-capita from '01 peak, down 29% in absolute terms, trends for aspartame have been broadly similar. ***Increased consumption of HIS in juices, energy drinks and vitamin waters have helped buffer this trend for the category as a whole.***
- Per-capita consumption of all HIS has been essentially flat for a decade, though this belies the recent success of stevia and sucralose with per-cap CAGR of 13% and 6.5%, respectively over past three years.
- In terms of applications, stevia has seen growth in beverage and table top, sucralose in food.

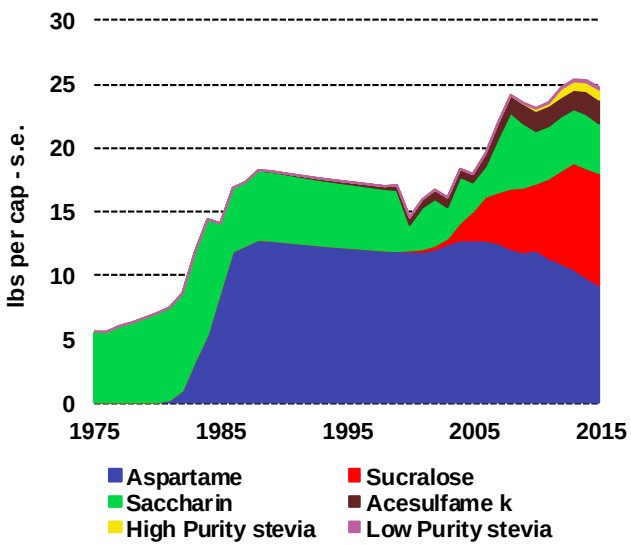
Soft drink consumption in the US



Share of HIS going to beverages



Per capita HIS consumption

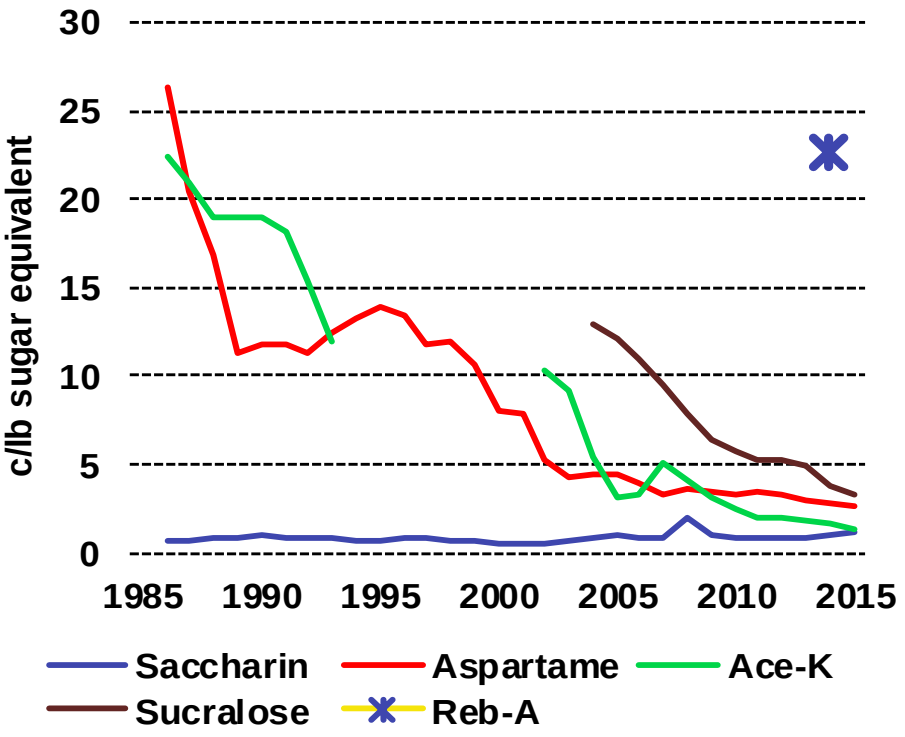


Source: LMC Estimates.

HIS – prices and production

With patents expired and a glut of production capacity, prices for most HIS have converged with production costs.

US prices for HIS



Source: LMC estimates.

- Over capacity in China has forced closures in the rest of the world. Today China represents close to 80% of global production of HIS.
- At the end of 2014, citing foreign competition, this country's sole remaining producer of Aspartame, Nutrasweet, ceased operations.
- However, in 2015, T&L moved all sucralose production to the US from Singapore. That said only 20% of the HIS consumed in the US is produced here.

On the horizon?

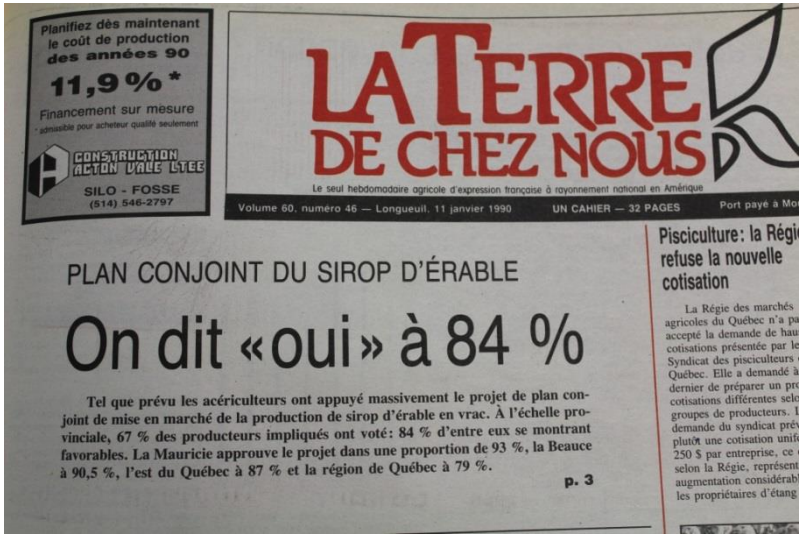
- *Monk Fruit* – ADM partnership with GLG
- *Allulose* – T&L/Matsutani - 70% of sweetness, 85% fewer calories, similar physical properties.
- *Fermented stevia* – Cargill/Evolva producing Reb D and Reb M with same amount of leaf.
- *Structured sugar* – Nestle - surface area of molecule increased to reduce sugar needs up to 40% in some applications.

Maple Syrup Marketing - FPAQ

Fédération des producteurs acéricoles du Québec (FPAQ) /

Federation of Quebec Maple Syrup Producers – legal authority

- FPAQ regulates the production and marketing of maple syrup produced in Quebec.
- 1956 – legal groundwork for FPAQ, the « Act Respecting the Marketing of Agricultural Food and Fish Product » (Loi sur la mise en marché des produits agricoles, alimentaires et de la pêche) created two tools:
    - The « joint plan », which allows producers to organise to market a specific product.
    - Agricultural Marketing Boards / Régie des marchés agricoles et alimentaires du Québec (RMAAQ), which have the authority to monitor joint plan management.
- Beginning in 1958, syrup producers in the Beauce region of Southern Quebec participated in a joint plan to protect their rights as producers and collectively market maple syrup.
- FPAQ founded in 1966 under Professional Syndicates Act.
- In 1990, 67% of Quebec producers voted, 84% in favor, to implement a joint plan.



Maple Syrup Marketing - FPAQ

FPAQ production increased rapidly in 2000s along with the introduction of three major marketing tools:

2002 – Creation of bulk maple syrup sales agency managed by FPAQ

- Single desk selling.

2002 - Beginning of global strategic maple syrup reserve

- 2002 - Plessisville – 8 million pounds of capacity.
- 2008 - Saint-Antoine-de-Tilly – 20 million pounds.
- 2011 – Saint-Louis-de-Blandford (rented) – 10 million pounds.
- 2013 - Laurierville – 98 million pounds.

2003 – Establishment of production quotas

FPAQ marketing agreements

All buyers or processors of maple syrup and maple water are required to negotiate marketing conditions and terms of sale for that product with FPAQ

- At a minimum, this must be renegotiated every two years and approved by RMAAQ.
- 61 authorized buyers are represented by Conseil de l'industrie de l'érable (CIE).
- Critical elements discussed in the agreements include:
  - Minimum prices and marketing costs.
  - Definition of an authorized buyer and requirements for becoming one.
  - Quality and grade verification.
  - Payment terms.
  - Storage and handling of maple products and barrels.
  - Requirements for use of industrial grade syrup.
  - Lot sales.
- In the event FPAQ and CIE cannot reach an agreement, then RMAAQ oversees an arbitration process. This last happened in 2012.

FPAQ marketing agreements

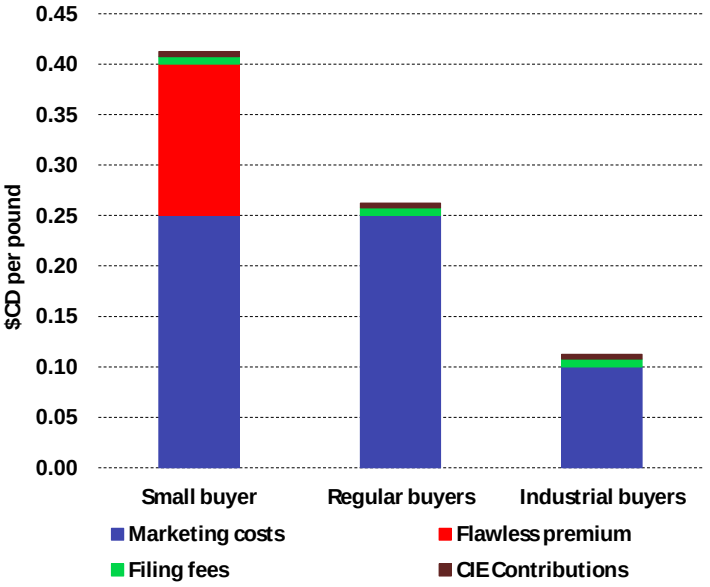
After three years of flat prices for maple syrup, prices were increased in 2016, marketing costs paid by the seller add between 9-15% to theses prices.

In 2017, product classification was brought in line with International Maple Syrup Institute (IMSI) Standards, which were adopted by USDA in 2015.

Because of its instability, maple water is more expensive than syrup when expressed in sugar equivalent terms.

Known as lot/batch sales, over the course of the year FPAQ will release select volumes, establishing minimum and maximum sales volumes, of specific grades of syrups, to specific classes of buyers (regular, industrial and small). Occasionally FPAQ will also provide rebates to move certain classes of syrup or encourage purchases from new customers.

FPAQ marketing costs by buyer size

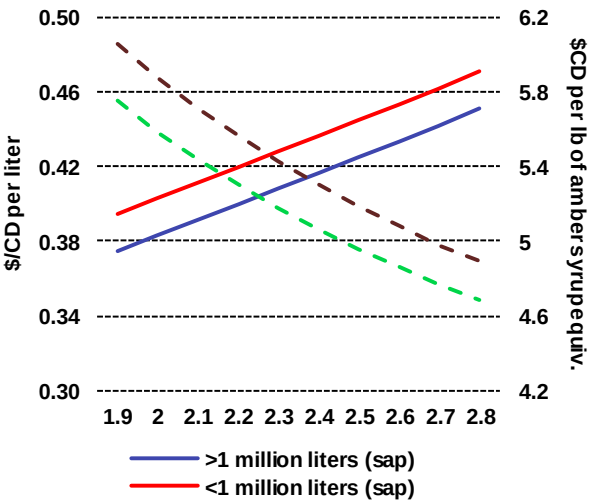


Source: FPAQ

2017 FPAQ quality standards and prices/premiums for syrup $CD

Polarity	Grade	2017 Price
>75%	A-Golden	2.95
75%<50%	A-Amber	2.94
50<25%	A-Dark	2.85
27%<6%	A-Very Dark	2.55
<6%	NC	1.80
Organic Premium		+0.180

2015 prices for maple water $CD



FPAQ strategic reserves

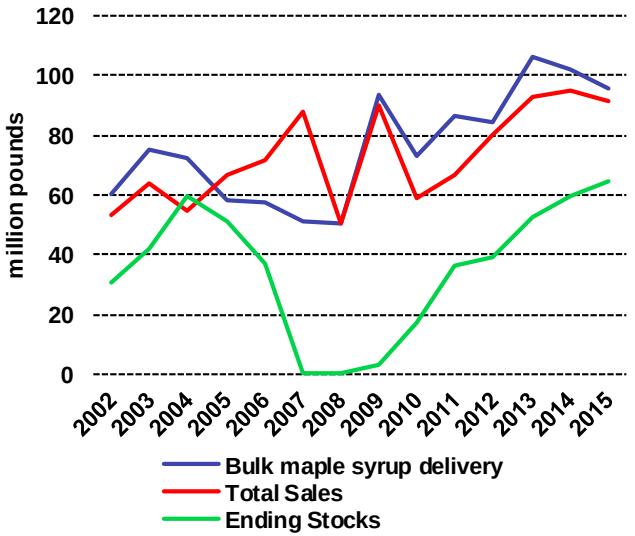
International Strategic Reserve is used to balance the market

Total reserve capacity is capable of holding a full year's worth of production. Reserve stocks have been growing as US has become less reliant on Canadian imports.

By end of 2015 they had reached a record 60 million pounds.

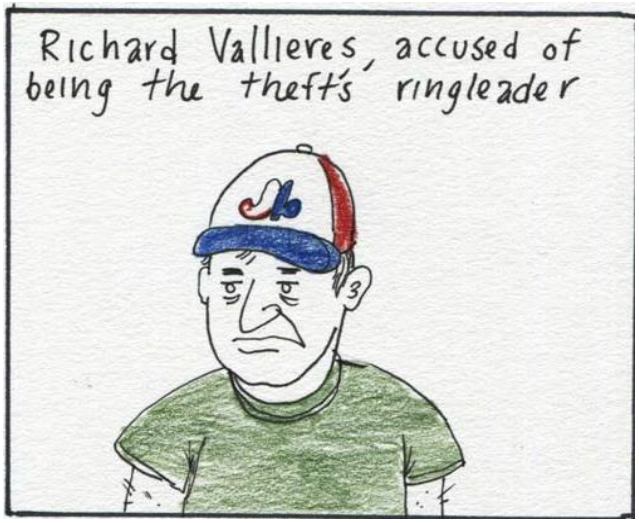
In 2012, nearly 6 million pounds, 13% of the Reserve, with an estimated street value of $13.4 million was stolen from the reserve. Most of this was moved to New Brunswick where FPAQ regulations don't apply. Only 2/3rds of the stolen syrup was recovered.

Change in FPAQ reserves over time



Global strategic reserves in Laurierville

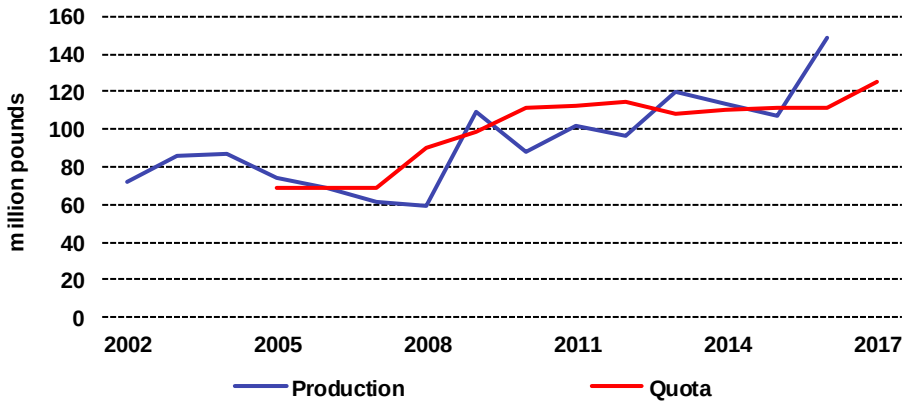
In 2012, 6 million pounds were stolen from the ISR



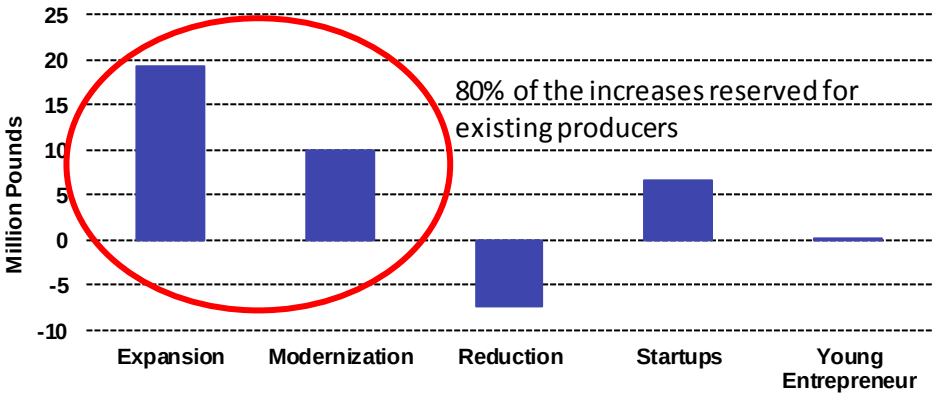
Source: FPAQ

FPAQ quotas

Production relative to quotas



Quota changes by category 2008-2017



Source: FPAQ

Quotas dictate who can market maple syrup but do not put a hard cap on production

In 2005, quotas for individual producers were set at 75% of the average production of 2004, 2003 and the highest year of production between 1998 and 2002. In 2008, this was increased to 90%. In 2010 this was increased to 100%.

Between 2008 and 2013, FPAQ also increased production by increasing quota to existing producers under a growth component and for modernization activities. It also added quota for new producers. A quota increase was also enacted for 2017.

The quota does not limit production. In fact, one could argue that FPAQ has encouraged over-quota production by limiting the “growth component” to producers who consistently approach quota limits.. However, payments to quota production are made first.

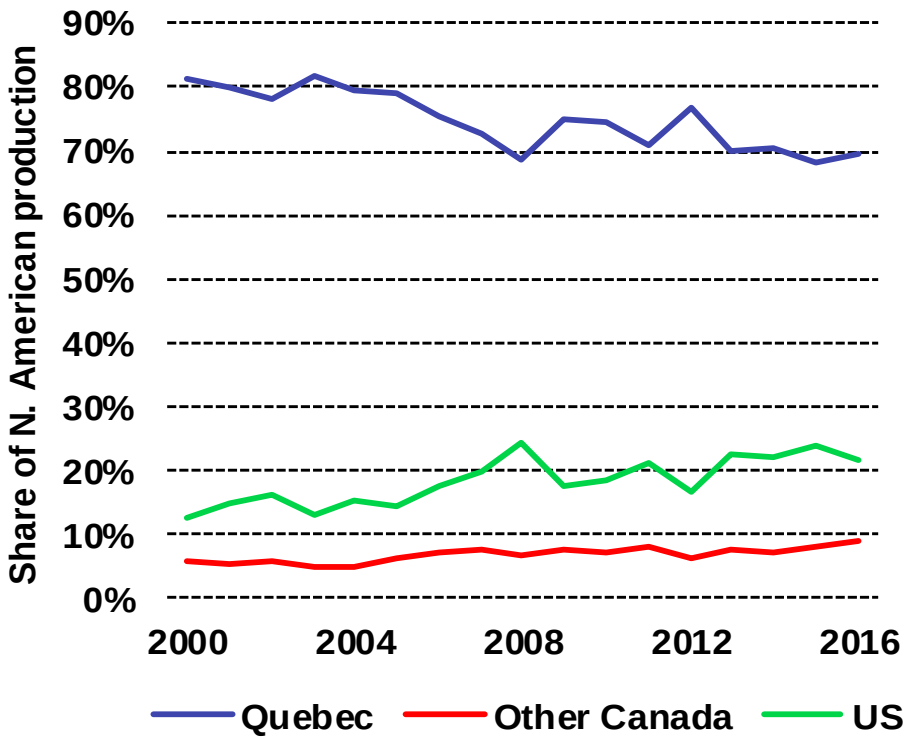
Since 2013, FPAQ will purchase non-quota (distinct from over-quota) syrup subject to a $1.20 per pound penalty to integrate black market producers.

Out of/over quota production can be sold on farm (<5kg containers). Over quota production can be sold direct to grocery stores as long as marketing fee (12c/lb) is paid.

FPAQ – signs of duress

FPAQ has come under criticism as of late for a number of reasons. most common refrain is that by propping up prices and limiting Quebec supply, the cartel has simply ceded market share to the US and other Canadian provinces.

Quebec share of N. American production



Source: USDA NASS

- Quebec market share has fallen ten percentage points in a decade.
- Before recent expansion there were 2,000 individuals in line for new quota, now may be lower.
- In some cases producers have waited seven years to get paid full value of syrup.
- FPAQ currently has 400 investigations underway concerning illegal sales among its members.
- FPAQ charges 12 c/lb for their services.
- 2013 ruling allows FPAQ to seize black market syrup. Over one million pounds seized since then.
- "Quebec want us to join," - "We don't want to join because we have all the advantages and none of the disadvantages. *Jean-François Laplante – New Brunswick Maple Syrup Association.*
- Gagne report

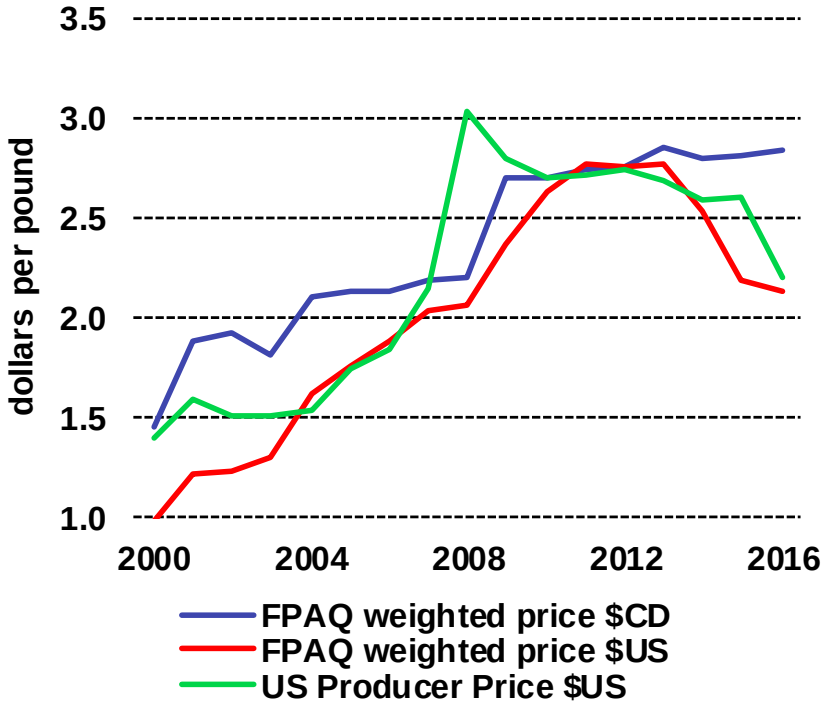
FPAQ cartel has created opportunities for US producers

Increased prices commanded by FPAQ have trickled down to producers in the US and other Canadian provinces.

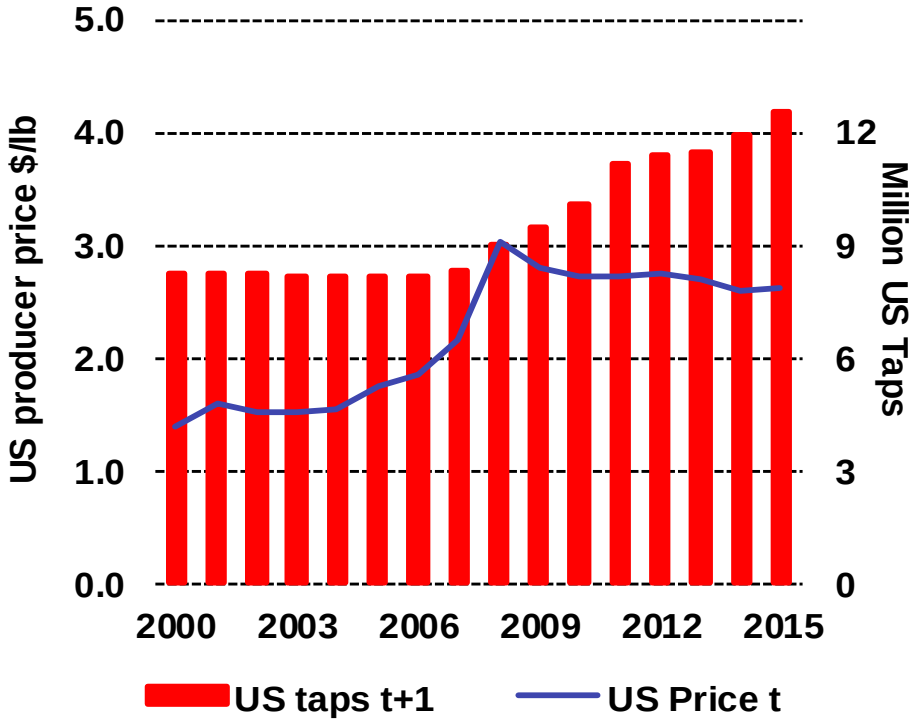
With the FPAQ reserves exhausted the year before, US prices spiked in 2008. Through 2014, US producers received another boost from a strong Canadian dollar.

High prices since 2008 have lead to a 50% increase in US taps.

Relationship between FPAQ price and US producer price over time



Rising producer price and increased taps in the US

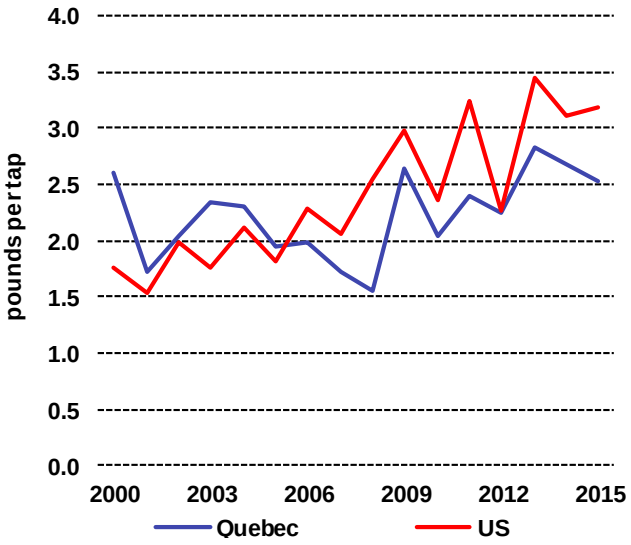


Source: FPAQ / USDA NASS.

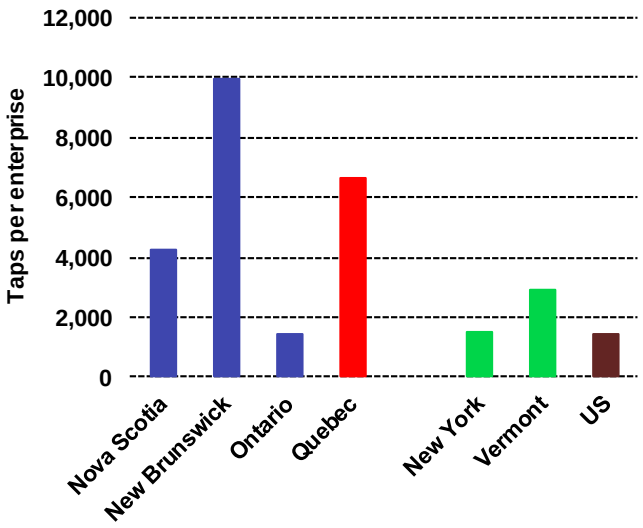
US has some intrinsic advantages in maple syrup production

- US climate and soils are conducive to larger healthier maple trees. The climate also leads to a longer tapping season.
- Between 2010-2015, US yields were, on average, 20% higher than those of Quebec. As US operations become more larger and more intensive, this yield advantage will grow.
- The inventory of sugar maple and red maple trees in the US is far higher than that of Quebec. US maple syrup production potential is probably between 15-20 times higher than that of Quebec.

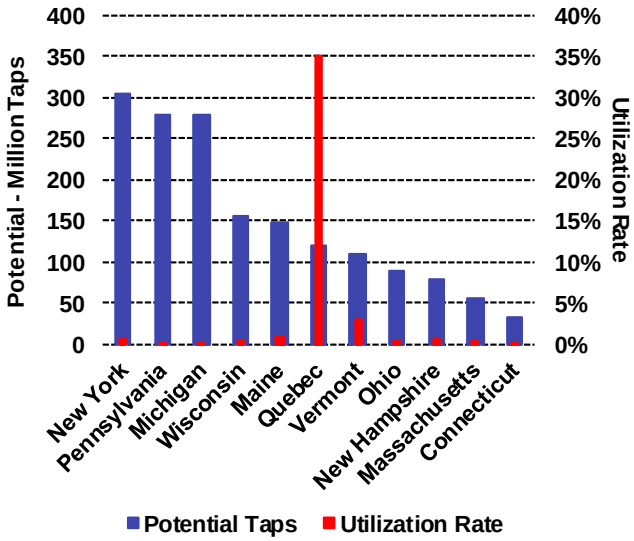
Yields per tap in the US and QC



Average size of operation in US and CD



Maple inventory and "untapped potential" in US and QC



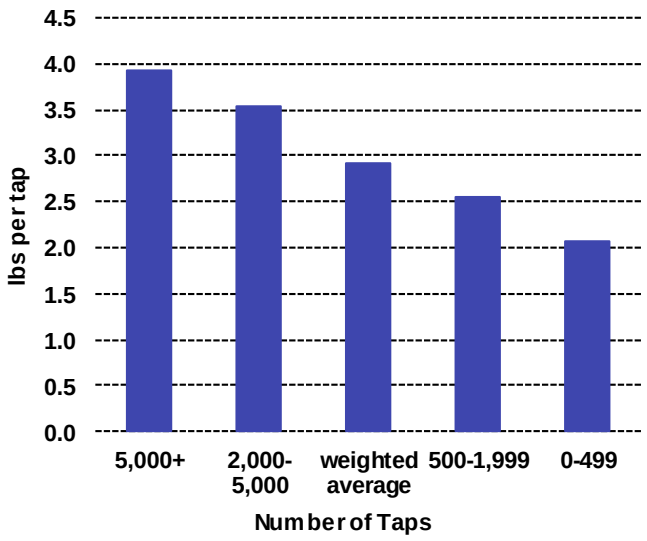
Source: Cornell University

Science and capital are changing the face of the industry

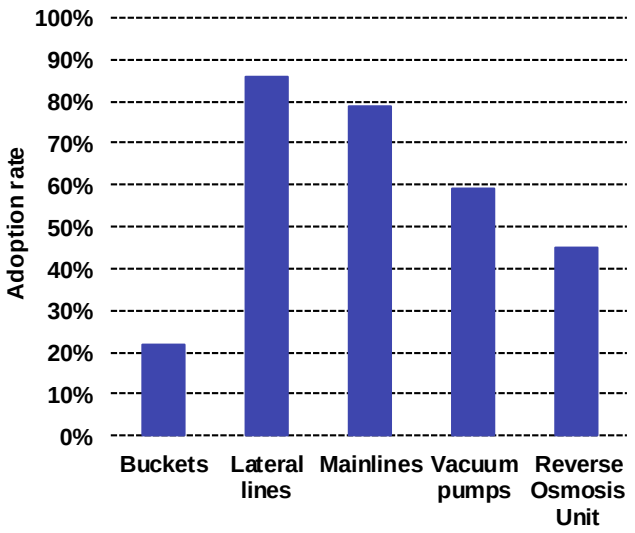
Technology is pushing Maple Syrup from a wild-harvested food to modern agribusiness

- Use of vacuum tubes has been around for more than 40 years ago but as recently as of mid-2000s most US producers were still collecting sap with buckets.
- Rapid technological advancement since then. High quality vacuum tubing has doubled yields. Reverse osmosis units have reduced fuel costs five-fold.
- Producers under the old paradigm may produce for $4 per pound. The most efficient can produce for less than $2 per pound.

Yields per size of operation in Vermont



Technology adoption rates in Vermont



Main and lateral sap lines

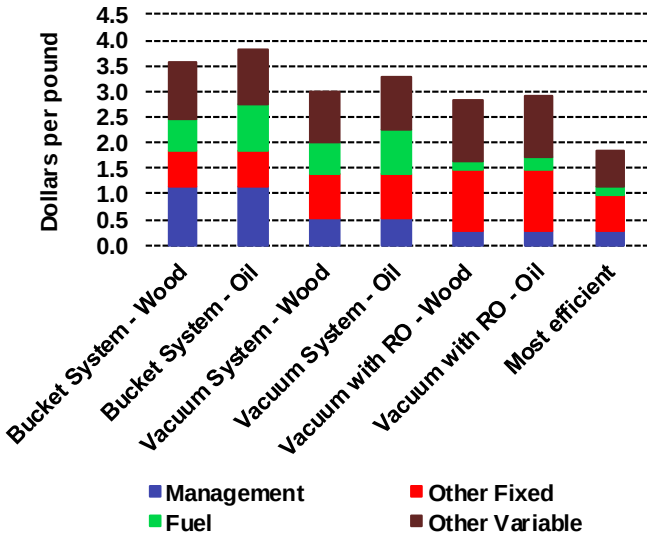
Source: Cornell University / U. of Vermont

Science and capital are changing the face of the industry

Higher prices have attracted new investment and new research

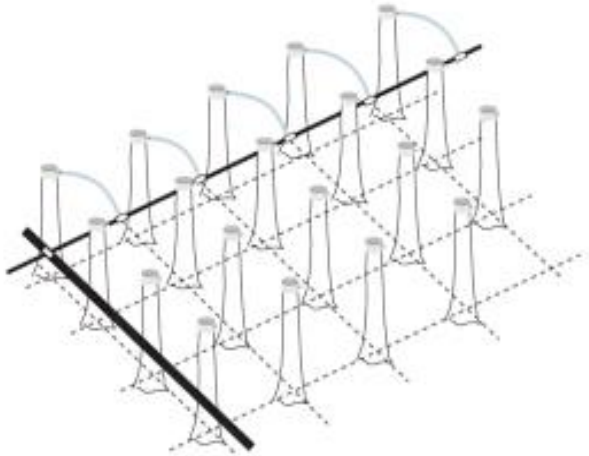
- Private equity jumped into the business under the moniker “Sweet Tree LLC”, owned by North Carolina based “Barings”, which most notably owns the rights to “Bust a Move” and the entire portfolio of Kenny G.
- In 2015 it tapped 93,000 trees on 27,000 acres. In 2016, this increased to 200,000 trees making it the largest producer in the US. Long term, they have their sites on 750,000 taps.
- Today maple is tapped from 35+ yo trees as sap flows down from the branches in the early spring. Research is being done on tapping 7 year old sapling and pulling liquid out with a vacuum. Cost are still prohibitively high but researchers say there is potential to increase yields ten-fold.

Production costs under various technology regimes



Source: U. of Vermont / Ohio State University

Layout of sapling plantation



Sapling method on 7 year old tree

Summary and outlook

Context

- Demand for Maple Syrup is growing rapidly, major untapped potential outside of North America.
- Its natural / home grown image is in vogue with today's affluent consumer.
- Current supply glut, but this cost is borne solely by Quebeckers.

Opportunities

- US intrinsic advantages to production.
- Technical innovation.
- Industrial scale production – taking syrup into the 21st century.

Challenges

- Climate change (shorter tapping season / drought / invasive species).
- Economic tradeoffs of tapping and saw timber production, especially among large landowners.
- Weakness of the Canadian dollar may discourage new US production.
- Narrow window of activity, remote location, make labor a challenge.
- Killing the golden goose.
    - The end of FPAQ?
    - Overproduction?

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