How New Technology and Market Access is Increasing the Role of Mexico in Global Produce Trade

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for
Global Trade Symposium
New York City
December 2, 2014
• US fresh produce imports and the growing role of Mexico
• Mexico’s export concentration on the US market
• Primer on protected culture
• The fresh berry story
• The N. American fresh market tomato story
• Conclusions
US Fresh Produce Imports, by Key Category, $Millions, 1994-2013

Source: USDA GATS online queries, BICO-10.
Fresh fruit and vegetable imports as a share of US fresh utilization/consumption, 2013 (despite rising imports most of US consumption is still produced here)

<table>
<thead>
<tr>
<th>Item</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetables, excl. melons and potatoes</td>
<td>27.3</td>
</tr>
<tr>
<td>Melons</td>
<td>33.0</td>
</tr>
<tr>
<td>Potatoes</td>
<td>7.0</td>
</tr>
<tr>
<td>Fruit, all</td>
<td>51.5</td>
</tr>
<tr>
<td>Excluding Bananas</td>
<td>35.2</td>
</tr>
</tbody>
</table>

Source: Economic Research Service, USDA.
## Value Shares of Total U.S. Fresh Fruit Imports, by Product

<table>
<thead>
<tr>
<th>Product</th>
<th>1990-92</th>
<th>2010-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bananas</td>
<td>59</td>
<td></td>
</tr>
<tr>
<td>Grapes</td>
<td>28</td>
<td>16</td>
</tr>
<tr>
<td>Other tropical*</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Berries</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>Avocados</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Citrus</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>Apples &amp; Pears</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Stone fruits**</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

* includes pineapples, mangos, papayas, durians

** includes apricots, cherries, peaches, plums

Source: Imports Contribute to Year-Round Fresh Fruit Availability, FTS-356-01, Dec. 2013, ERS/USDA
Value Shares of Total U.S. Fresh Fruit Imports, by Region: Mexico Wins!

<table>
<thead>
<tr>
<th>Region</th>
<th>1990-92</th>
<th>2010-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equatorial countries*</td>
<td>56</td>
<td>34</td>
</tr>
<tr>
<td>Southern Hemisphere</td>
<td>23</td>
<td>26</td>
</tr>
<tr>
<td>Mexico</td>
<td>13</td>
<td>33</td>
</tr>
<tr>
<td>Canada</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Others</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

* Equatorial countries include Costa Rica, Guatemala, Ecuador, Colombia, and Honduras
** Southern Hemisphere countries include Chile, Argentina, Peru, New Zealand, Brazil, South Africa, and Australia

Source: Imports Contribute to Year-Round Fresh Fruit Availability, FTS-356-01, Dec. 2013, ERS/USDA
NAFTA Fresh Produce Trade

• N. American fresh veg trade mainly intra-NAFTA!

• 77% of US fresh vegetable exports go to Canada, then 8% to Mexico.

• 2/3's of US fresh veg imports come from Mexico; most of the remainder from Canada.

• Fresh fruit trade is diverse – beyond NAFTA.

• Typically Mexico was much more of a veg than a fruit exporter. This is changing.
US Imports of Fresh Fruit and Vegetables from Mexico, 1993-2013 (excludes canned, frozen, juice and dried)

Source: USDA/FAS GATS.
Mexico’s Role in US Fresh Produce Trade

• Tomatoes, bell peppers, chile peppers, cucumbers, eggplant, green beans, asparagus, brussel sprouts, watermelon, limes, avocados, mangoes, table grapes, papaya, blackberries, raspberries (and emerging in blueberries and strawberries), green onions, sugar snap peas, cilantro many tropical and specialty fruit/veg, both Mexican and Asian.

• NOT important in leafy greens, broccoli, cauliflower, celery, onions, potatoes, apples, pears, cherries, kiwi, peaches/nectarines/plums, oranges, tangerines, grapefruit, bananas.
Mexican Fresh Produce Trade

- Mexico is a powerhouse fresh fruit and veg exporter and is an integral part of the North American fresh produce supply chain for many commodities.
- In 2013, Mexican fresh produce exports to the world totaled $8.743 billion including:
  - $4.9B fresh veg, plus
  - $3.9B fresh fruit.
- To put this in context, the USA exported $7.4 billion of fresh produce in 2013.
## Shares of Total Mexican Exports of Fresh Produce by Key Country of Destination

<table>
<thead>
<tr>
<th>Product</th>
<th>2003</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fruit</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% US &amp; Canada</td>
<td>86</td>
<td>92</td>
</tr>
<tr>
<td>% Other</td>
<td>14</td>
<td>8</td>
</tr>
<tr>
<td><strong>Vegetables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% US &amp; Canada</td>
<td>99</td>
<td>99</td>
</tr>
<tr>
<td>% Other</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Calculated by the author based on SIAVI database from Secretaria de Economia, Mexico, 2014. Source: Nielsen 52 weeks ending July 12, 2014. Excludes nontraditional retailers, such as, Walmart and clubs.
Mexican exports of avocados by key country of destination, 2003-2013 (million dollars)

Source: calculated by the author based on SIAVI database from Secretaria de Economia, Mexico, 2014.
Hass avocado sources of supply in the US market, million pounds, excludes Florida

Source: Hass Avocado Board, online data queries.
The Avocado Story in the US Market

- Mexico gradually achieved full market access.
- Important to include all shippers into a market as contributors to generic promotion or free riders will make the program unsustainable.
- California helped to create a national marketing order for promotion of all Hass avocados, including imports, administered by the Hass Avocado Board, assessments began in 2003.
- Demographic changes have stimulated demand.
- The Ca. avo industry is still competitive despite the rapid growth in imports. Generic promotion pays off!
- Major changes in relative competitiveness and market shares, and quickly!
Protected Culture (PC) – A continuum from passive to active control of the growing environment
Protected Culture Basics

• Structure location matters even if indoors! Climate, light levels, elevation, humidity, temps, etc.

• Production season length is especially important for the most capital intensive structures.

• Canada and the northeastern US cannot grow in the winter without lights, which is usually too costly unless serving a regional or niche market. They face spring-fall markets when prices are lower.

• Greenhouse is now in vogue in the USA and there is more interest in locating houses in northerly locations close to destination markets. Technology must improve to make viable and lower energy costs. Time will tell.
Protected Culture Basics

• Still subject to weather events.
• Economics vary greatly by location.
• Even shade house production is much higher technology and capital intensive than open field.
• Shade houses provide some protection from the elements, for all PC, the higher the technology, the more protection but not necessarily cost efficient.
• PC yields, quality, packouts are much higher than open field, usually get higher average prices but per unit costs are higher.
• Food safety, labor efficiency and plant disease advantages to PC.
A protected culture operation in Sinaloa, Mexico: A “warm climate” greenhouse
Sinaloa vs Rest of Mexico

• Sinaloa, a winter producer, has always been the biggest tomato exporter to the USA.

• Unlike in the USA, Sinaloa open field producers have aggressively pursued PC. Minimal extension of season but crop disease protection and other advantages.

• Low elevation and humid, hot summer climate means high tech greenhouses not appropriate there.

• To ship year-round, large Sinaloa growers are building higher technology houses in high elevations in central Mexico - temperate climates. As forward-integrated exporters they offer yr-round supplies to buyers.
Sinaloa vs Rest of Mexico

• PC production now exists in most Mexican states.

• About 50% of the PC acreage is estimated by AMHPAC to be located in Sinaloa, 15% in Jalisco and 12% in Baja.

• Outside investors have entered greenhouse production in Central Mexico, some are high tech.

• Many new entrants in Central Mexico have failed due to lack of industry understanding, insufficient capital to make it through 3 yr plus learning curve.

• Financing from Mexican and European govts have contributed to investments that aren’t market-driven.
Production of Peppers in Sinaloa, Mexico: Shade houses evolving into hybrids with greenhouses
Protected production enables controlled access to facilities, offering food safety benefits.
Hydroponic production (coconut substrate) of tomatoes in a greenhouse in Sinaloa, Mexico
Hydroponic production of tomatoes in a shade house in Sinaloa, Mexico
Protected culture production of raspberries in central Mexico
Plastic tunnel production of blueberries.

Source: Dave Brazelton, Fall Creek Farm and Nursery
Mexican Fresh Berry Export Industry: An economic cluster developed largely by California and Chilean berry firms
US Fresh Blackberry Imports by Source, 2006-2013

Source: GATS/FAS/USDA online data query.

Source: GATS/FAS/USDA online data queries.
USA Fresh Blueberry Imports by Key Country of Origin, 1990-2013

Metric Tons

Note: Jan-Sept 2014 imports from Mexico 7,010 MT vs 4,683 in CY 2013.

Source: GATS/FAS/USDA online data queries.
PC production of blueberries in Central Mexico
Despite the growth, imports still represented only 13% of US consumption in 2013.
Protected culture production of strawberries, central Mexico.
Changing Role of Mexico

• Mexico just got market access to China for blackberries and raspberries.
• Several flights/week from Guadalajara to Hong Kong.
• Shipments may start in early January 2015.
• Matching fund export promotion dollars are available from ProMexico.
• Export volumes may amount to 5-10% of export value.
• Chile has duty-free access while Mexico faces 25% duty.
Changing Role of Mexico

• Mexico is likely to replace much of the fall blueberry volume from Argentina in the USA.

• If Mexico succeeds with strawberries and blueberries it may tighten the market windows of other players.

• Loss of methyl bromide and the ability to find replacements may play a role in production location.

• Labor availability and costs are likely to affect location of production.
Fresh Tomato Market Supply and Consumption: A Story of Cannibalization and Market Saturation
Fresh Tomato Types

Field-grown only
Mature green tomatoes
Vine-ripe tomatoes
Tomatillo

Protected culture only
Beef/round tomatoes with calyx
Tomatoes-on-the-vine (TOV)

Both field-grown and protected culture
Grape tomatoes
Romas
Cherry
Heirloom
Other specialty
US Fresh Tomatoes: Production, Consumption, Imports, and Exports, 1990-2013

Production, Consumption, Imports, and Exports, 1990-2013

Sources: USDA/ERS, Vegetables and Pulses Yearbook Data May 30, 2014; includes an estimated 603.3 million pounds of US greenhouse tomato production and imported greenhouse tomatoes.
US Fresh Tomato Imports, All Types, by Key Country, 2009-2013, million pounds

Millions

<table>
<thead>
<tr>
<th>Country</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico</td>
<td>3,500</td>
<td>3,000</td>
<td>3,000</td>
<td>3,200</td>
<td>3,100</td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Other Countries</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3,500</td>
<td>3,000</td>
<td>3,000</td>
<td>3,200</td>
<td>3,100</td>
<td>6,800</td>
</tr>
</tbody>
</table>

Sources: US Department of Commerce Foreign Trade Statistics.

<table>
<thead>
<tr>
<th>Crop</th>
<th>Value (million dollars)</th>
<th>Volume (thousand metric tons)</th>
</tr>
</thead>
</table>

U.S. Fresh Field Tomato Production, California and Florida only, (excludes other states and greenhouse) 1982-2013

Sources: various USDA/NASS Vegetable Annual Reports; and Vegetables Final Estimates 2008-12, Aug. 2014.
Specialty and Greenhouse Tomatoes

Y.E.L.O. Youth, Energy, Life, Om...™
Specialty and Greenhouse Tomatoes
Specialty and Greenhouse Tomatoes
US Fresh Tomato Trends

- Foodservice is >50% of tomato volume and relies on mature green tomatoes.
- Foodservice sales took a hit during the economic downturn, contributing to profit pressure.
- Mature green tomato industry lost its retail market: only about 7% of tomato quantity sold is mature green.
US Retail Fresh Tomato Trends

- Consumption/purchases via retail channels seems to have maxed out.
- During the period 1997-11, for the store universe Nielsen had at the time, the quantity (and $) of tomatoes sold at retail declined in the USA from a peak in 2007 - due to the economic downturn.
- 52 wk scanner data ending Sept 27, 2014 shows low growth. Hothouse growing at only 0.7% in quantity even slower than the total category.
- Great diversity in tomato types but they cannibalize each other.
US Fresh Tomato Retail Market Shares (in $ and pounds)
Type, in Key Retailers, 2014

Dollars
- Hothouse: 51%
- Field: 34%
- Undefined: 15%

Quantity
- Field: 49%
- Hothouse: 40%
- Undefined: 11%

Within Hothouse

- Beefsteaks and TOV declining.
- Growth is in the snacking category, and specialties, including heirloom.
- Packaging playing a growing role, with much innovation in both varieties, colors, shapes among leading Canadian and US greenhouse firms. Mexico lagging.
- All firms focusing on technology improvements, upgrades as competition rises.
In recent years there was little expansion in the US and Canadian greenhouse industries, with most expansion in Mexico.

More recently some US producers are expanding, as well as in Ontario (not BC).

Some of this growth may be because in the last 2 yrs part of US capacity was not in production due to disease or weather damage. Possibly only ~1200 acres among the major players were shipping.
Within Hothouse

• The impact of this may not be fully taken into account when making expansion decisions.

• Huge capital requirements for high tech greenhouse construction, >$1 million/acre.

• Outside investors find industry sexy, and some investments may not be market driven.

• Recently some large Mexican producers may be slowing investment in PC tomatoes.
Big Picture

- Mature green tomato industry, having lost most of its retail market, is now facing potential competition in the domain it has owned, foodservice.

- Facing a saturated retail market, hothouse producers have an incentive to get the right varieties for foodservice. Breeders may or may not deliver and relative cost is a factor.
Spotlight on Mexican Fresh Tomato Imports: Story of shifts in type of production and growth in yr-rd availability, but growers face market saturation.
Total US Tomato Imports, by Key Tomato Type, All Countries, 2009-2013 (millions of pounds)

<table>
<thead>
<tr>
<th>Year</th>
<th>Cherry</th>
<th>Grape</th>
<th>Hothouse</th>
<th>Roma</th>
<th>Round</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>0</td>
<td>0</td>
<td>1,000</td>
<td>500</td>
<td>0</td>
<td>1,500</td>
</tr>
<tr>
<td>2010</td>
<td>0</td>
<td>0</td>
<td>1,500</td>
<td>1,000</td>
<td>0</td>
<td>2,500</td>
</tr>
<tr>
<td>2011</td>
<td>0</td>
<td>0</td>
<td>2,000</td>
<td>1,500</td>
<td>0</td>
<td>3,500</td>
</tr>
<tr>
<td>2012</td>
<td>0</td>
<td>0</td>
<td>2,500</td>
<td>2,000</td>
<td>0</td>
<td>4,500</td>
</tr>
<tr>
<td>2013</td>
<td>0</td>
<td>0</td>
<td>3,000</td>
<td>2,500</td>
<td>0</td>
<td>5,500</td>
</tr>
</tbody>
</table>

Sources: US Department of Commerce Foreign Trade Statistics.
### US Hothouse Tomato Imports, by Key Country, 2009-2013 (million pounds)

<table>
<thead>
<tr>
<th>Country</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico</td>
<td>1,200</td>
<td>1,000</td>
<td>800</td>
<td>600</td>
<td>400</td>
</tr>
<tr>
<td>Canada</td>
<td>800</td>
<td>600</td>
<td>400</td>
<td>200</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>2,000</td>
<td>1,600</td>
<td>1,200</td>
<td>800</td>
<td>400</td>
</tr>
</tbody>
</table>

**Sources:** US Department of Commerce Foreign Trade Statistics.
US Round Tomato Imports, by Key Country, 2009-2013 (million pounds)

<table>
<thead>
<tr>
<th></th>
<th>Mexico</th>
<th>Canada</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td></td>
<td></td>
<td></td>
<td>430</td>
</tr>
<tr>
<td>2010</td>
<td>500</td>
<td></td>
<td></td>
<td>520</td>
</tr>
<tr>
<td>2011</td>
<td>400</td>
<td></td>
<td></td>
<td>460</td>
</tr>
<tr>
<td>2012</td>
<td>300</td>
<td></td>
<td></td>
<td>360</td>
</tr>
<tr>
<td>2013</td>
<td>200</td>
<td></td>
<td></td>
<td>280</td>
</tr>
</tbody>
</table>

Sources: US Department of Commerce Foreign Trade Statistics.
Most of this area is shade house rather than greenhouse, and most is from Sinaloa. Some may not be in production.

Source: Evolucion de la Oferta Horticola en Mexico, 1989-2009, CAADES, Sept. 27, 2010 and various other sources.
Canada: Area harvested of Greenhouse Tomatoes, 2007-2013 (acres)

Source: Stat Canada
US Fresh Tomato Monthly Imports from Mexico, 2013 vs 2004

Source: USDA GATS online queries.
Too soon to draw conclusions about the impact of the higher minimum prices in effect since March 2013.

So far volume is stable.

May cause producers to be more market-driven.

Restricting supply can lead to higher prices (due to relatively inelastic demand) but these may be difficult to sustain without acreage controls due to “supply response” dynamics; barriers to entry play a role.
Mexican Tomato Industry

• The development of new PC producers throughout Mexico is bringing new tomato products into the domestic market, competing both with traditional small producers in central Mexico and growers in Sinaloa and Baja in their seasons.

• PC is a major new force for this dual market crop (export and domestic markets are both important to profitability for some grower-exporters), and may become more important with the higher suspension prices.
• The berry cluster in central Mexico is attracting attention from tomato PC producers there.
• Will there be synergies between these two commodity sectors?
• Could there be non-market driven expansion in berries given the allure of PC production?
Potential Mexican Concerns

- Security.
- Institutional instability.
- Trade disputes.
- Partner risk.
- Intellectual property right risks.
- Corruption, legal structure, transaction costs.
- Investment coming from outside the sector which is not market driven.
- Water.
- Social issues.
- Labor.
- Capital costs
Mexico's Farm Workforce Has Declined between 1995 and 2010 – No panacea there either

Workforce in millions

Source: ARE Update May/Apr 2013 16(4):1-4
Conclusions

• Tomato market focusing more on quality, with emphasis on flavor, aided by seed innovation.
• Export marketing from Mexico still too fragmented, disrupts market.
• Consolidation already occurred with US and open field shippers.
• Consolidation expected among US GH shippers.
• Higher suspension prices may impose more market orderliness, to the benefit of most, time will tell.
Conclusions

- Future of foodservice tomato market a big unknown.
- At retail, demand is maturing for tomatoes and cannibalization is rampant, across tomato types and sectors.
- The Mexican berry export sector is likely to grow, with growing pains expected.
- Mexico will continue to expand produce exports as long as market demand warrants.
- Proximity means focus on the USA, but growth elsewhere as market access improves.
- All producers must think carefully about scaling their operations to meet market demand!