



BRIEFING

Briefing No. 117

August 2014

U.S. Sugar and Sugar Beet Price Variability

Gary W. Brester & Case Stiglbauer

Introduction

U.S. wholesale sugar prices increased to record high levels in 2011 and 2012 but declined in 2013 and 2014 (figure 1). Sugar beet prices are highly correlated with wholesale sugar prices. Consequently, Montana sugar beet prices reached record levels for the 2011 and 2012 crops, but have declined since (figure 2).¹ The primary cause for both the increase and subsequent decline in prices was world weather factors. Two consecutive years of poor weather and associated low sugar production (2011 and 2012) caused world prices to reach record levels. This period was followed by two consecutive years of good weather (2013 and 2014) in which production increased and caused sugar prices to decline. However, U.S. sugar

prices have historically been insulated from world price volatility by domestic agricultural support policies. This briefing paper highlights sugar price variability, summarizes the U.S. sugar program, and outlines challenges faced by the industry in the future.

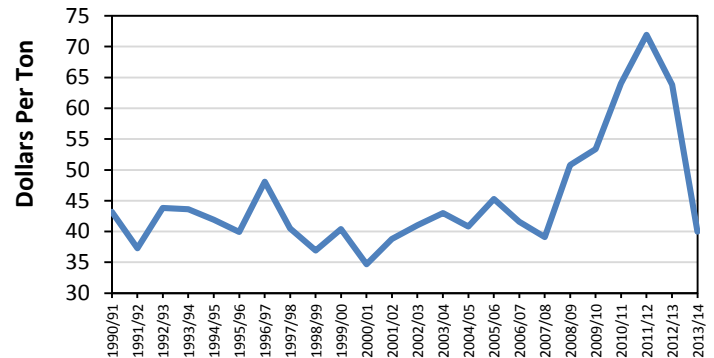
Agricultural Marketing Policy Center

Linfield Hall
 P.O. Box 172920
 Montana State University
 Bozeman, MT 59717-2920
 Tel: (406) 994-3511
 Fax: (406) 994-4838
 email: ampc@montana.edu
 website: www.ampc.montana.edu

Contact:

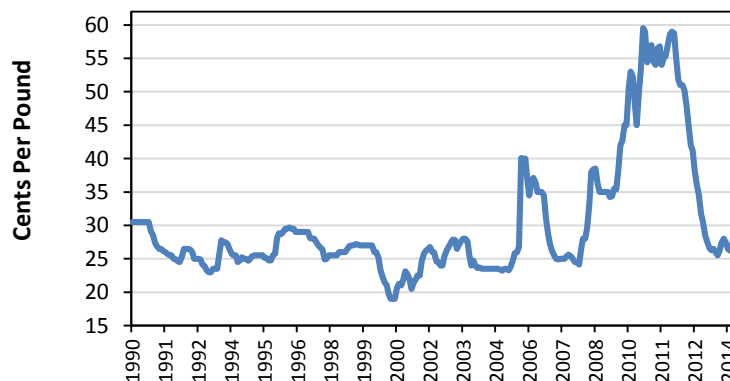
Gary W. Brester
 (406) 994-7883
gbrester@montana.edu

Figure 2. Montana Sugar Beet Prices



Source: USDA/ERS Sugar and Sweeteners Yearbook

Figure 1. U.S. Wholesale Refined Beet Sugar Price Midwest Markets



Source: USDA/ERS Sugar and Sweeteners Yearbook

Objective
Analysis For
Informed
Decision Making

¹ The fiscal year reference includes the months October to September. For example, the fiscal year beginning October 2009 and ending in September 2010 is referred to as FY 2009/10. Single-year designations represent calendar years, which include the months January to December.

U.S. Sugar Policy

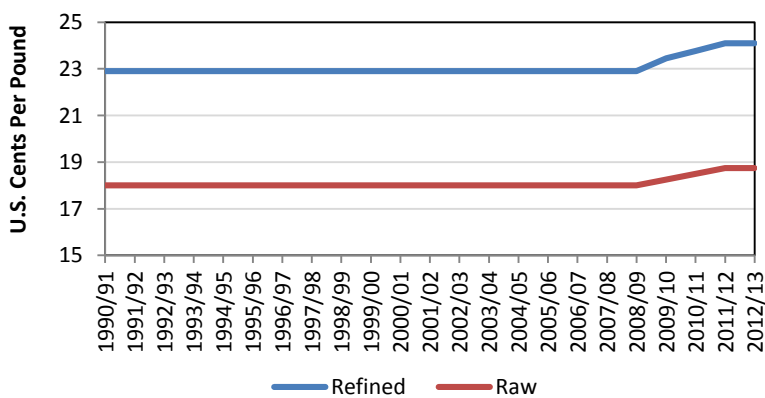
The origins of U.S. sugar policy can be traced to 1789, when the fledgling U.S. government levied a tariff on imported sugar. The purpose of the tariff was to raise money for the U.S. Treasury rather than to support a domestic industry, given that little sugar was produced in the United States at the time. The U.S. sugar industry developed in the 19th and early 20th centuries. The 1934 Sugar Act established various sugar import tariffs and was the first federal program intentionally designed to support the industry. The stated purpose of the 1934 Act, and its successors, was to ensure an adequate supply of sugar and to keep U.S. sugar prices above world prices. Later, import quotas and domestic processor marketing allotments were implemented to meet this dual mandate. Since 1934, the U.S. sugar program has been continued through a series of Acts, with a suspension of government intervention in the market occurring only once-- in the early 1970s when world sugar prices spiked for a couple of year (Pasour and Rucker, 2005).

Modern iterations of the U.S. sugar program began with the 1977 Farm Bill. The bill identified sugar as a protected commodity and gave the U.S. Department of Agriculture (USDA) the authority to purchase sugar and issue nonrecourse loans as a means to keep domestic prices above world prices.² Several other commodity marketing loan programs are available to crop producers. But, the sugar marketing loan program is directed at processors because the bulk and short shelf life of sugar beets and sugarcane requires that both be processed quickly into sugar for storage and trade. To qualify for such loans, processors agree to pay producers for sugar beets and sugarcane proportionally to the value of the marketing loan (Wiltgen, 2007).

The 1985 Food Security Act introduced an additional objective for the sugar program -- to operate as much as possible at "no cost" to U.S. taxpayers. This objective has subsequently played an important role in policy discussions. To meet the no-cost policy stipulation, a combination of import restrictions and domestic supply controls is used to maintain domestic sugar prices above the Commodity Credit Corporation (CCC) loan rate. While TRQs are used to restrict U.S. sugar imports, domestic supply controls restrict domestic production and CCC nonrecourse marketing loans establish a minimum price floor.

The USDA estimates total sugar needs for each coming year by forecasting sugar consumption and export quantities. Hence, accurate estimates of U.S. sugar use are essential for establishing import restrictions and domestic production targets. The USDA attempts to match estimates of total domestic supply with estimates of total domestic consumption to keep domestic sugar prices at or above CCC loan rates. Each domestic sugar processor is allocated a percentage of the domestic sugar market in exchange for the opportunity to participate in the CCC loan program using the Overall Allotment Quantity (OAQ) program. The OAQ establishes limits (marketing allotments) on the amount of sugar that can be sold by each domestic sugar processing company for that company to remain eligible for CCC loans. In the absence of production limits, domestic sugar production would increase and cause domestic prices to consistently fall below the CCC loan rates, resulting in government expenditures associated with loan forfeitures.

Figure 3. Average CCC Loan Rates



Source: USDA/ERS Sugar and Sweeteners Yearbook

² Processors can obtain marketing loans from the U.S. government at a value stipulated by the Commodity Credit Corporation (CCC) for refined or raw sugar. Although loan rates vary by region/state, refined beet sugar and raw cane sugar loan rates averaged 24.09 cents and 18.75 cents per pound, respectively, in recent years. If the domestic price of sugar is above the loan rate, processors sell sugar in the domestic market, and the marketing loan is repaid along with accumulated interest. This type of loan is a typical "recourse" loan. However, the loans are considered to be "nonrecourse" if domestic wholesale prices are lower than the CCC loan rate. If so, processors can forfeit the loan collateral (i.e., refined or raw sugar) to the CCC in lieu of repaying the loan. Essentially, nonrecourse loans create a price floor at the CCC loan rate for U.S. wholesale sugar prices.

Between 1996 and 2001, U.S. sugar policy was the product of the 1996 Federal Agriculture Improvement and Reform Act (FAIR). The FAIR Act continued to allow sugar processors access to marketing loans from the CCC. These loans, however, were deemed nonrecourse if TRQ imports exceeded 1.5 million tons.³ Loans became recourse if TRQ imports were stipulated to be less than 1.5 million tons. The rationale for the distinction was that if large TRQ imports occurred, then it is more likely that domestic sugar prices would decline. Hence, nonrecourse loans would provide a minimum wholesale sugar price for processors.⁴ However, the FAIR Act suspended domestic processor marketing allotments. The termination of domestic supply controls (and concurrent lower prices of other agricultural commodities that were production substitutes) resulted in a substantial increase in domestic sugar production. The subsequent reductions in sugar prices caused substantial sugar loan forfeitures and costs to taxpayers.

The 2002 Food Security and Rural Investment (FSRI) Act made several important changes to the 1996 FAIR Act, including the reinstatement of processor marketing allotments as a means for restricting domestic production. Furthermore, marketing loans were deemed to be exclusively nonrecourse. The most recent farm bill (the 2014 Agriculture Act) continues the FSRI sugar policies. The result of the post-1977 sugar programs is that U.S. sugar prices are well above world prices as long as world production is not adversely affected by weather events in major sugarcane-producing regions (figure 4).

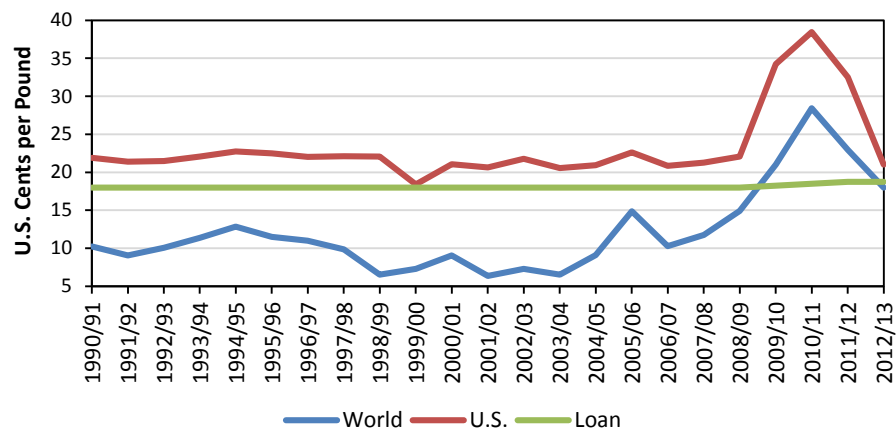
Although the 2002 legislation reinstated domestic sugar production restrictions, recent trade negotiations have complicated the USDA's ability to control total U.S. sugar supplies. The 1994 North American Free Trade Agreement slowly relaxed restrictions on Mexico's access to the U.S. market. In 2008, Mexico's domestic sugar industry was granted unrestricted access. Although the TRQs negotiated in the 1994 WTO agreement set soft, but essentially, binding limits on the amount of sugar imported from many countries, they have not applied to Mexico since 2008.

Recently, U.S. sugar prices have been near or below CCC loan rates which has led to sugar forfeitures. Forfeited sugar is generally sold at heavy discounts to ethanol plants.⁵ Because of transportation, storage, and price discounting, forfeited sugar represents a cost to taxpayers and violates the 1985 (and subsequent) Farm Bill "no-cost" component of U.S. sugar policy.

Mexico and U.S. Sugar Imports

Since their introduction in 1994, sugar TRQs have been an effective U.S. import control measure. Mexico's unrestricted access to the U.S. sugar market, however, has reduced the USDA's ability to control U.S. sugar supplies and maintain U.S. sugar prices above CCC loan rates.

Figure 4. U.S. and World Raw Sugar Prices



Source: USDA/ERS Sugar and Sweeteners Yearbook, Intercontinental Exchange nearby closing no. 11 and no. 16

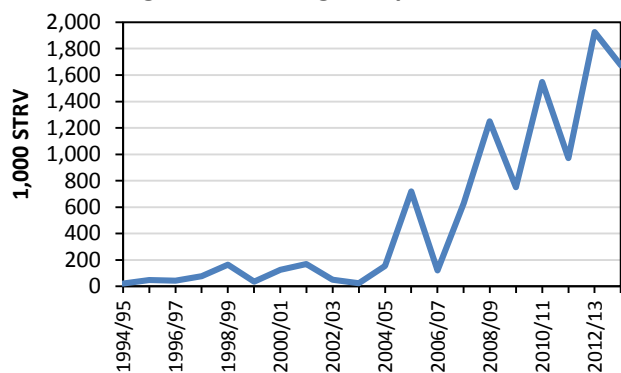
³ Unless otherwise noted, all quantities in this paper are in short tons, raw value (STRV). A short ton is a U.S. measure representing 2,000 pounds. One short ton equals 0.907 metric tons or, conversely, one metric ton equals 1.102 short tons. Raw value refers to the weight of raw sugar. Sugarcane is processed into a raw component (brown crystals) before being refined into white sugar. Typically, raw sugar weight is 107 percent of refined sugar weight.

⁴ The decision as to whether loans would be recourse or nonrecourse was actually *fait accompli*. U.S. trade agreements stipulate that TRQ imports could be no less than 1.491 million tons (i.e., the sum of 1.231 million tons of cane sugar and 25,954 tons of refined sugar). This value was almost identical to the FAIR Act's 1.5 million tons needed to trigger nonrecourse loans.

⁵ The Feedstock Flexibility Program for Bioenergy Producers is used to sell CCC loan-forfeited sugar to non-food users (primarily ethanol plants).

Although varying from year to year, U.S. imports of Mexican sugar have been increasing on average since 2005/06 (figure 5). In FY 2012/13, the United States imported a record amount of sugar from Mexico (1.925 million tons). Sugar imports from Mexico in FY 2013/14 are expected to be slightly lower than FY 2012/13 because of lower Mexican production.

Figure 5. U.S. Sugar Imports from Mexico

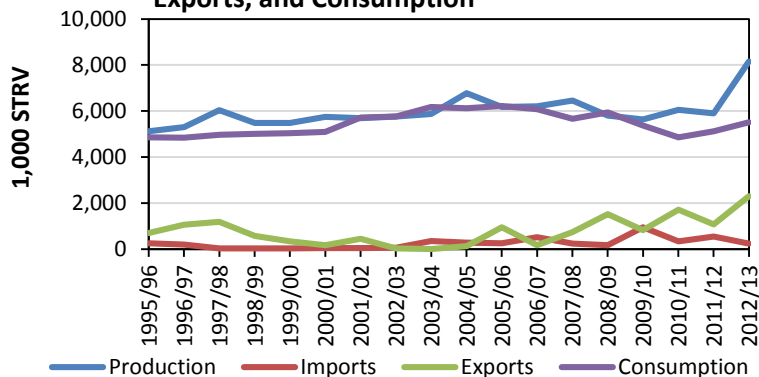


Source: USDA/FAS Global Agricultural Trade System

In FY 2012/13, increases in Mexican sugar imports largely offset declines in TRQ sugar imports from other countries and, as discussed above, total U.S. imports were 13.3 percent lower than in 2010/11. However, Mexico's share of those total imports increased to 68.9 percent in FY 2012/13.

Mexican sugar production has increased from about 6 million tons to just over 8 million tons over the past six years (figure 6). This supply response was at least partially the result of increased access to the U.S. sugar market where policy-driven prices are generally well-above world levels. Furthermore, imports of sugar by Mexico have been relatively flat. Hence,

Figure 6. Mexico Sugar Production, Imports, Exports, and Consumption

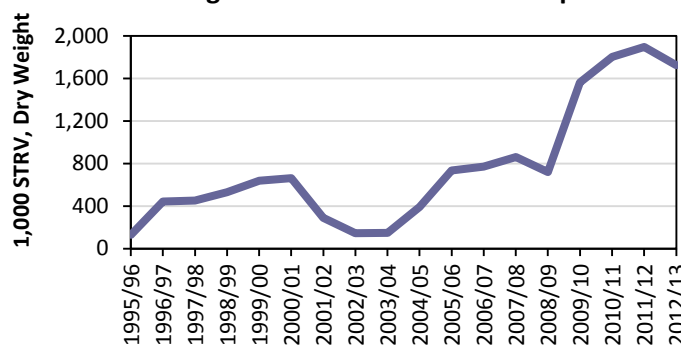


Source: USDA/ERS Sugar and Sweeteners Yearbook

the source of expanded Mexican exports to the United States does not appear to be caused by transshipments of sugar imported from other countries through Mexico.

Mexican domestic sugar consumption has declined by about 1 million tons since 2008/09, and Mexico's exports have increased by about that same amount. Mexico's sugar consumption has declined as the use of high fructose corn syrup (HFCS) by Mexican food processors has increased (figure 7). Some of the impetus for this substitution has been recent increases in sugar prices that, in part, were driven by Mexico's expanded access to the U.S. sugar market. Approximately 28 percent of Mexico's HFCS use is produced domestically, and 80-90 percent of the corn (about 2 million tons) needed to produce it is imported from the United States. The remaining 72 percent of Mexico's HFCS use is also imported, primarily from the United States.

Figure 7. Mexico HFCS Consumption



Source: USDA/ERS Sugar and Sweeteners Yearbook

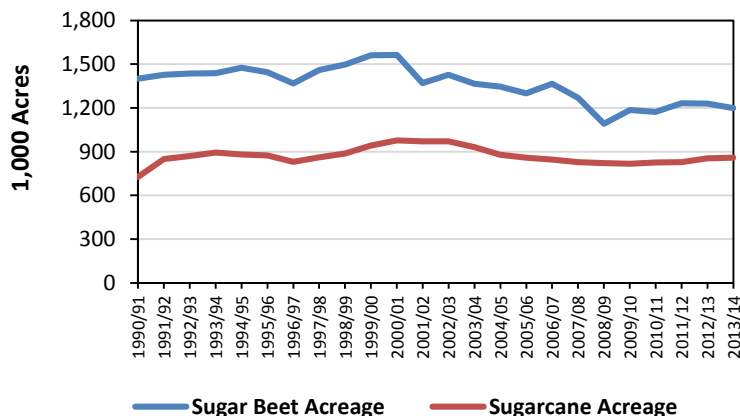
Technological Change in the U.S. Sugar Industry

In the United States, the area planted to sugarcane has been relatively constant at around 900,000 acres over the past 25 years (figure 8). Although somewhat variable, sugarcane yields have averaged about 35 tons per acre over that period (figure 9). In contrast, sugar beet yields have increased substantially over the past 15 years because of technological change (figure 9).⁶ Thus, the amount of sugar produced by an acre of sugar beets has increased about 25 percent (from about 3 to 4 tons per acre) over the past 15 years (figure 10).

⁶ The introduction of glyphosate-resistant sugar beet seed varieties in 2008 increased per acre tonnage and extractable sugar contents for a variety of reasons. For example, the new technology has eliminated the use of non-selective herbicides. Although non-selective herbicides reduced (but did not eliminate) weed infestations, they also tended to stunt sugar beet plant growth. Reduced weed pressure has also boosted yields because competition for sunlight and soil nutrients has been greatly reduced. And, glyphosate-resistant technologies have reduced mechanical cultivation and soil compaction. Mechanical cultivation often harmed sugar beet plants, and reductions in soil compaction encourage plant growth, especially for root crops. Furthermore, weed reductions have reduced sugar beet pile losses because residual foliage generates heat that increases sugar beet spoilage during storage.

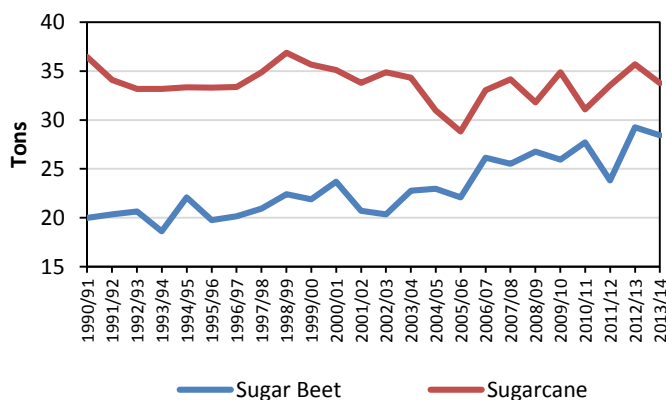
However, the amount of sugar obtained from an acre of sugarcane has remained relatively flat at about 4 tons per acre. As sugar produced from sugar beets per acre has increased, acreage devoted to sugar beet production has declined because of domestic sugar supply control mandates prescribed in successive farm bills as part of the U.S. sugar program (figure 8).

Figure 8. U.S. Sugar Beet and Sugarcane Acreage



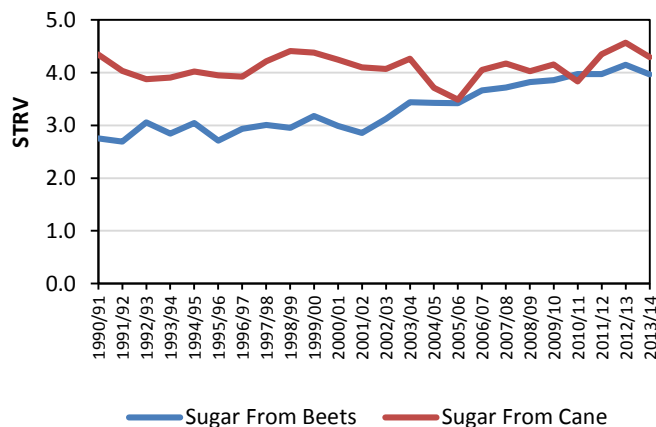
Source: USDA/ERS Sugar and Sweeteners Yearbook

Figure 9. U.S. Sugar Beet and Sugarcane Yields Per Acre



Source: USDA/ERS Sugar and Sweeteners Yearbook

Figure 10. U.S. Sugar Production Per Acre



Source: USDA/ERS Sugar and Sweeteners Yearbook

Future U.S. Sugar Industry Challenges

The NAFTA agreement has limited the ability of the United States to control supplies of sugar to the domestic market. Because of good weather and technical innovations, record U.S. sugar production occurred in FY 2013/14. Although U.S. sugar production from sugarcane may decline a little in 2014/15, sugar produced from sugar beets will be similar to this past year. Weather conditions in Mexico and Brazil may cause some declines in world sugar production. But, such declines will probably not substantially reduce downward pressures on world sugar prices in 2014/15. If world sugar prices are appreciably lower than U.S. CCC loan rates, then it is likely that TRQ countries will come close to filling their U.S. TRQ quotas (i.e., to levels that have historically averaged over 90 percent). Because initial TRQ allocations this year are consistent with previous years at (1.231 million tons), a 90 percent TRQ fill rate would increase the amount of sugar supplied to the U.S. domestic market by at least 500,000 tons over the preceding year. Furthermore, Mexico is likely to export only a slightly smaller amount of sugar to the United States this year relative to last year.

Given that U.S. sugar prices are currently near CCC loan rates and some sugar nonrecourse loan forfeitures have already occurred in 2014, it is possible that low U.S. sugar prices will cause relatively large nonrecourse loan forfeitures in the coming year. Such forfeitures represent losses to the U.S. Treasury and, therefore, violate the “no-cost” (to the federal government) provision of the U.S. sugar program. Consequently, domestic and/or import supply quantities will have to be reduced to avoid these monetary outlays.

Summary

U.S. sugar policies have traditionally established a minimum domestic wholesale sugar price and insulated U.S. prices from world sugar price variations. The program has caused U.S. sugar prices to exceed world prices. However, recent high world prices were caused by world production shortfalls. These high world prices substantially increased U.S. domestic prices because U.S. processors have the option to export sugar to other countries. Over the past two years, however, world sugar production has recovered and world prices have declined. The U.S. sugar program supports sugar prices through a

combination of sugar import restrictions, domestic supply controls, and nonrecourse CCC loans. The ability to limit sugar imports has been reduced by the NAFTA agreement, which since 2008 has allowed Mexico unrestricted access to the U.S. sugar market. Mexico has increased sugar production and reduced sugar consumption, as food processors substitute HFCS for granulated sugar (which happened in the United States over thirty years ago).

The combination of increasing U.S. sugar beet productivity and sugar imports from Mexico has expanded U.S. sugar supplies. In addition, low world prices may cause other sugar exporting countries to fill their U.S. TRQ import allocations over the next several years. If so, domestic prices will decline to levels near CCC loan rates, and sugar processors will likely forfeit sugar placed under marketing loans. Such forfeitures could cause substantial U.S. Treasury monetary outlays. Given that the United States produced about 9 million tons of sugar last year, it appears that domestic sugar production will have to be reduced by 5-10 percent in future years to accommodate the expansion of Mexican sugar imports that has occurred since 2008, and the likely return to a 90 percent TRQ fill rate by other countries.

References

Pasour, E.C., Jr, and Rucker, R.R. (2005). *Plowshares and Pork Barrels: The Political Economy of Agriculture*. Oakland, CA: The Independent Institute.

U.S. Department of Agriculture. (2014). *Sugar and Sweeteners Yearbook Tables*. Retrieved from www.ers.usda.gov/data-products/sugar-and-sweeteners-yearbook-tables.aspx.

U.S. Department of Agriculture, Foreign Agricultural Service (USDA/FAS). (2014). *Global Agricultural Trade System Online*. Interactive database. <http://apps.fas.usda.gov/gats/>.

Wiltgen, T.J. (2007). "An Economic History of the United States Sugar Program." M.S. thesis. Montana State University. Bozeman. August. (unpublished).



Copyright 2014

The U.S. Department of Agriculture (USDA), Montana State University and Montana State University Extension prohibit discrimination in all of their programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital and family status.