Analysis of the U.S. Sugar Safety Net and A Potential Sugar Beet Revenue Protection Program

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This report examines the policy and market landscape shaping risk management in the U.S. sugar sector, with a focus on the potential introduction of Revenue Protection (RP) crop insurance for sugar beets under the Federal Crop Insurance Program (FCIP). It analyzes the relative price volatility of sugar compared to other major crops, evaluates historical adoption patterns of yield versus revenue protection plans, and projects the fiscal implications of introducing RP coverage. The findings provide insights into likely shifts in insurance participation and cost outcomes under alternative adoption scenarios.

Key Insights

- **Price Volatility Analysis**
  - World raw sugar prices are between 8%-64% more volatile than prices for other major domestic commodities (corn, soybeans, wheat, oats, barley, peanuts, rice, sorghum).
  - At the same time, prices for major domestic commodities are between 28%-95% more volatile than domestic raw sugar prices.
- **Adoption Patterns and Substitution Effects**
  - Historical data shows RP introduction leads to sharp declines in YP participation across all commodities with revenue protection options.
  - Average RP adoption starts at 26% in year one and reaches 50% by year ten after introduction.
  - RP policies are consistently purchased at higher coverage levels than YP policies, with differences typically under 10 percentage points.

- **Projections**
    - Status-quo adoption scenario: Costs increase from $61 million (2024) to $82 million (2034), representing $93 million in additional spending over the decade
    - Full adoption scenario: Total costs reach $87 million by 2034, with a net additional cost of $178 million over ten years after accounting for YP offsets
    - Moderate adoption (30% cap): Costs stabilize around $71-82 million annually
    - Our analysis indicates that introducing sugar beet revenue protection would result in modest incremental costs when accounting for adoption patterns and substitution effects.
- **Caveats**
    - The analysis holds acreage, coverage, and premium rates constant, omits farmer behavioral responses such as acreage expansion, coverage-level shifts, and shifts in unit structure.
    - Approved Insurance Providers' reinsurance decisions affecting underwriting gains are not considered.
    - The analysis also applies premium differentials from more volatile commodities without adjusting for sugar beets' uniquely low price volatility.

Introduction

The U.S. sugar sector operates under a distinct policy framework that limits exposure to global price volatility through marketing allotments, loan programs, and import restrictions. While these mechanisms have helped stabilize prices, sugar producers, particularly those growing sugar beets, do not currently have access to revenue protection insurance through the FCIP, despite high participation in existing yield-based plans.

This report evaluates the potential introduction of a sugar beet revenue protection product by examining market conditions, historical insurance adoption patterns, and projected costs under various uptake scenarios. It also assesses how sugar price volatility compares to that of other major crops, and how the unique characteristics of sugar marketing affect the feasibility of actuarial design. The findings are intended to support ongoing policy discussions around expanding insurance options for sugar producers and improving the risk management tools available within the FCIP.

Background

Domestic Production

Sugar production in the U.S. primarily comes from two commodities: sugar beets and sugarcane. Total combined harvested acres have declined slightly over the last several decades (see **Appendix Figure S1**). Total harvested acres in 2000 were just over 2.35 million acres, with 42% attributed to sugarcane and 58% attributed to sugar beets. By 2009, harvested acreage stabilized around 2 million acres per year. Between 2009 and 2024, harvested acres stayed between 1.85 million and 2.06 million, with an

average allocation between sugar beets and sugarcane of 57% and 43%. For perspective, harvested acreage for NASS-designated principal crops in 2024 was 294 million acres, with sugar (both sugar beets and sugarcane) representing well below 1% of this total.[1] Corn and soybeans are the two largest principal crops in terms of harvested acreage and represented approximately 57% of the harvested area for principal crops in 2024.

Although acreage in production has declined slightly since the early 2000s, yields have risen steadily over the last several decades, particularly for sugar beets. Since 2000, yields have trended upward at a rate of about 0.6% per year for sugarcane and 1.7% per year for sugar beets. Despite slight declines in harvested acreage, the increases in yields per acre have generally offset these reductions in acreage, meaning total sugar production has risen over the past two decades.

Geographically, sugar beet production primarily occurs in the northern parts of the U.S., such as southern Idaho, Montana, Wyoming, Colorado, Nebraska, and Michigan. The most prominent region for sugar beet production is in the Red River Valley on the border of North Dakota and Minnesota. This region accounts for approximately 54% of total production (according to the 2022 Census of Agriculture). Alternatively, sugarcane production primarily takes place in Louisiana and Florida, with some production in South Texas.

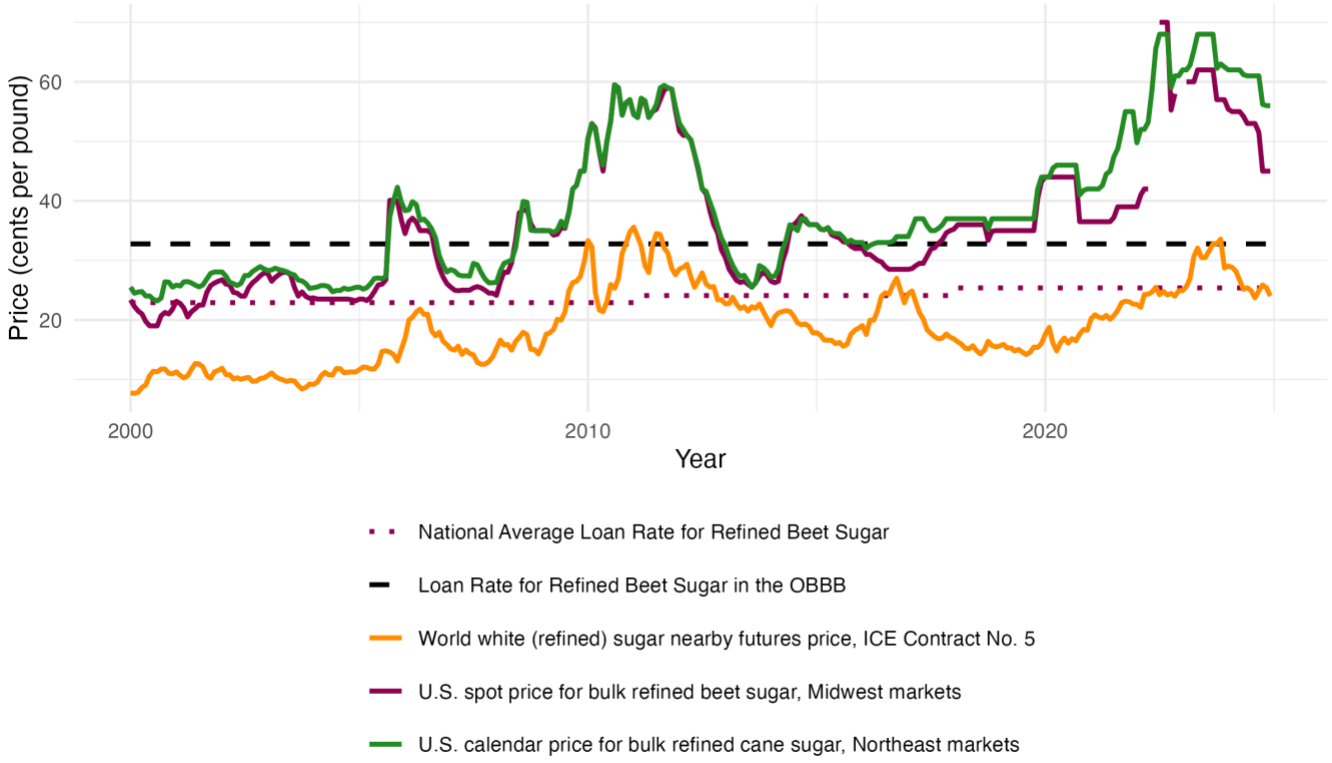
U.S. Sugar Imports

U.S. sugar import policy operates through a tariff-rate quota (TRQ) system that sets annual import quotas with low tariffs for in-quota volumes and high tariffs for above-quota imports. For the fiscal year 2025, the raw sugar TRQ is 1.1 million metric tons with additional quotas for refined sugar and specialty products. The policy framework includes suspension agreements with Mexico that govern volume and pricing terms, and various re-export programs that allow U.S. manufacturers to access world-priced sugar for export markets. These import controls, combined with domestic supply management, have historically maintained U.S. sugar prices above world market levels, contributing to the relatively stable price environment that characterizes the domestic sugar market (see **Figure 1**).

U.S. sugar imports have shown notable volatility and structural shifts in recent years. In fiscal year 2023/24, total U.S. sugar imports reached approximately 3.85 million short tons, raw value (STRV), a 7% increase over the previous year and the second-highest level on record after 2019/20 (see Figure S4 in the appendix). This increase was driven in large part by a surge in high-tier (over-quota) sugar imports, which rose to a record 1.18 million STRV, overtaking imports from Mexico as the second-largest source of foreign sugar for the first time.

[1] Principal crops are corn, sorghum, oats, barley, rye, winter wheat, Durum wheat, other spring wheat, rice, soybeans, peanuts, sunflower, cotton, dry edible beans, chickpeas, potatoes, canola, proso millet, and sugar beets.

Figure 1: Monthly U.S. and World Refined Sugar Prices, 2000–2024



Note: ICE = "Intercontinental Exchange". OBBB = "One Big Beautiful Bill". Missing data in 2022 and 2023 is the result of supply chain issues, leading to refined beet sugar being unquoted due to a lack of spot supplies. A similar figure showing the relevant loan rates for raw cane sugar is available in ***Appendix Figure S5****.*

Source: Author construction using data from the USDA.

Domestic Policy Landscape

Unlike most commodities that rely on general Title I programs such as Agriculture Risk Coverage and Price Loss Coverage, sugar operates under sector-specific policies designed to provide market stability. The U.S. sugar program includes marketing assistance loans that establish a price floor (recently raised to 24 cents per pound for raw cane sugar and 32.77 cents per pound for refined beet sugar), marketing allotments that coordinate domestic supply with projected consumption needs, and the Feedstock Flexibility Program that provides an outlet for surplus sugar through ethanol production when market conditions warrant. These policies work alongside import management through tariff-rate quotas to maintain orderly market conditions and reduce price volatility for both producers and processors.

The coordinated nature of these policies helps create a more stable price environment compared to other agricultural commodities. Marketing allotments are set annually based on projected domestic consumption, with allocations divided between beet sugar (54.5%) and cane sugar (45.7%). When potential oversupply situations arise, the Feedstock Flexibility Program allows for market adjustment by diverting excess sugar to ethanol production, helping maintain balance between supply and demand.

This framework of market management tools contributes to the relatively predictable price patterns that characterize the domestic sugar market.

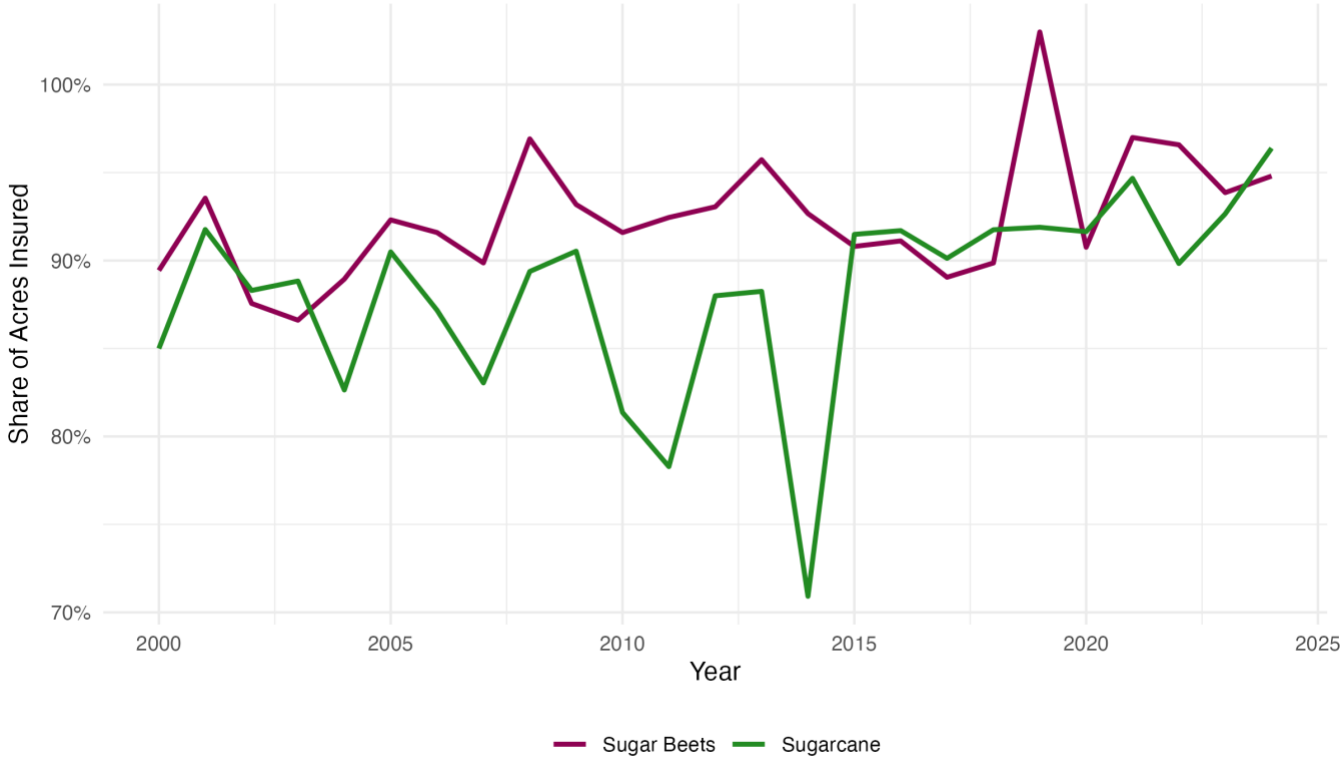
Federal Crop Insurance

Although the sugar program provides several policy interventions that limit price risk, these programs do not mitigate the effects of low yields. Crop insurance policies offered through the Federal Crop Insurance Program and administered by the USDA Risk Management Agency (RMA) are the primary tool for management of yield risk. For sugar beet and sugarcane producers, the primary insurance plan available is the Actual Production History (APH) plan. The APH plan protects low yields by basing coverage on each producer's historical production record. A producer submits up to 10 years of verifiable yield data for a crop-county combination; the average of those yields is used to set the APH yield, which becomes the basis for the insurance guarantee. The producer then selects a coverage level, which is typically between 50% and 85% in 5% increments, and a price election percentage ranging from 59% to 100% in 1% increments.

If the farm's actual yield in the insured year falls below the guaranteed yield (APH x coverage level), the policy pays an indemnity equal to the shortfall between the guaranteed yield and actual yield, valued at the product of the projected price and the elected price election percentage. Insurance premiums are partially subsidized by the Federal Government and vary based on the producer's chosen coverage level and unit structure election. Notably, sugar producers do not have revenue protection crop insurance plans, which are typically the most participated in plans among major field crops.

Figure 2 shows insured acres as a share of harvested acres for both sugar beets and sugarcane. Some year-to-year variation exists, but overall, crop insurance participation rates for sugar beets are very high, with an average of 92% of all harvested acres insured from 2000 to 2024. The share of insured acres for sugarcane is slightly lower and more variable, but overall, still relatively high. The average insured share of harvested acres from 2000 to 2024 for sugarcane was 88%. The weighted (by insured acres) average coverage level for APH policies purchased by sugar beet and sugarcane producers from 2000 to 2024 was 70% and 50%, respectively. On average, these policies attracted an annual actuarially fair premium of about 5 cents per dollar of liability. They received a subsidy of 60 cents per dollar of premium, thus leaving sugar beets and sugarcane producers with an out-of-pocket cost of 2 cents per dollar of liability.

Figure 2: Sugar Beet and Sugarcane Insured Acres as a Share of Harvested Acres, 2000-2024



*Note: Harvested acres are those reported in **Appendix Figure S1**. Insured acres are those reported as being enrolled in an APH insurance plan according to the USDA, Risk Management Agency.*

APH plans under the FCIP offer sugar producers flexible coverage, but even for the most comprehensive coverage level (85%), payments don't start until losses exceed 15% of the insured value of the commodity. At more typical coverage levels of 50–70%, significant losses can occur before any crop insurance indemnity payments are made. To address this, area-based supplemental policies were introduced in 2014, with the supplemental coverage option (SCO) in 2015 and the enhanced coverage option (ECO) in 2021 (Turner et al., 2023).

The supplemental coverage option (SCO) must be combined with an underlying basic policy (APH in the case of sugar) and provides area-based coverage that mimics the protection type of the underlying basic policy. SCO provides indemnity payments when county yields fall below 90% of their expected level with payments based on the difference between 90% and the coverage level of the underlying policy.[2] The Enhanced Coverage Option (ECO), like SCO, offers protection for losses that would not surpass most traditional policies' deductible (which is generally 15% or more of the expected loss), must be combined with an underlying policy, and calculates payments based on reductions in county yields.

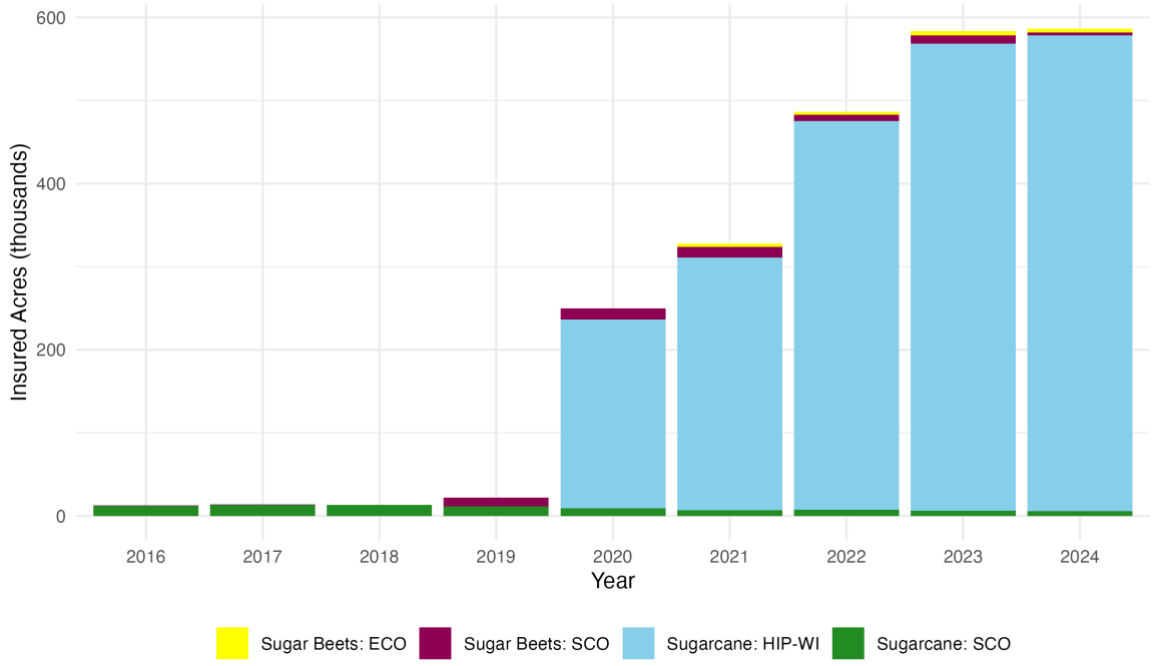
[2] Prior to the passing of the One Big Beautiful Bill Act, the converge level was set at 86%.

The primary difference between ECO and SCO is that ECO offers protection for losses between 86% and either 90% or 95% (depending on the level chosen by the producer) of the expected yield. In other words, ECO provides indemnity payments for smaller declines in county yields whereas larger declines are required to trigger SCO payments. As of 2024, out of 122 county programs with APH availability for sugar producers, almost all (121) offered SCO and ECO.

Sugarcane growers also have the option to purchase the Hurricane Insurance Protection – Wind Index (HIP-WI) endorsement. HIP-WI covers the shortfall between a producer's underlying crop-insurance guarantee and 95% of the crop's expected value. The farmer selects a HIP-WI coverage percentage from 1 to 100%; this percentage is applied to that shortfall (the hurricane coverage range) to calculate the hurricane-protection amount. When sustained hurricane-force winds from a named storm are recorded in the producer's county or any adjacent county, the farmer receives the full hurricane-protection amount as an indemnity. Notable restrictions for HIP-WI are that it is available only for counties in proximity to the Gulf Coast and Atlantic Ocean (meaning it is typically not available in areas where sugar beets are grown) and cannot be combined with the Enhanced Coverage Option.

Figure 3 shows that in 2024, only about 14,000 insured acres of sugar beets and sugarcane were supplemented with SCO or ECO policies. Despite broad availability, adoption remains low. From 2016 to 2023, just 0.64% and 3.32% of eligible acres of sugar beets and sugarcane were, respectively, enrolled in SCO and ECO. In contrast, HIP-WI, introduced in 2020, saw a strong uptake. By 2024, 573,000 sugarcane acres (equivalent to about 65% of total harvested acres) were insured under HIP-WI.

Figure 3: Sugar Beet and Sugarcane Insured Acres under Supplemental Endorsements

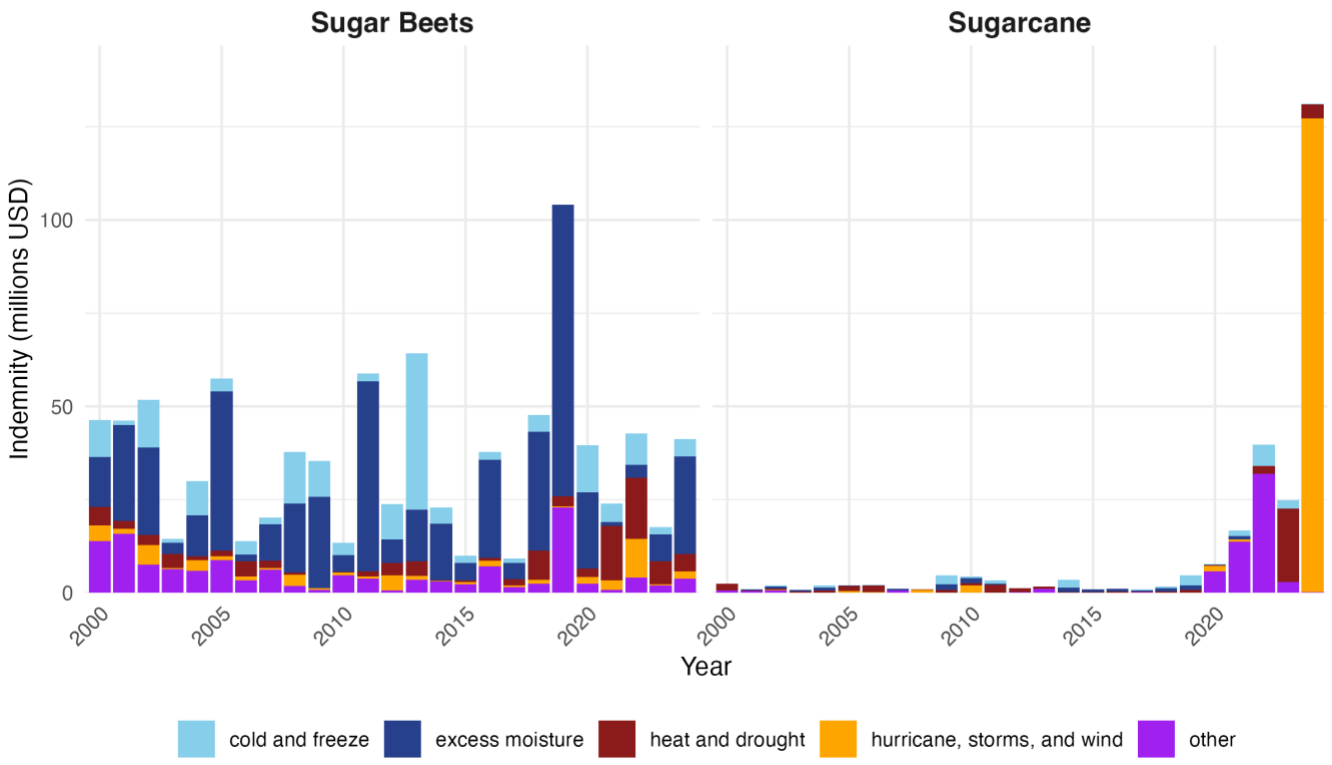


Source: Author construction using data from the USDA.

Indemnities paid out on insured sugar beet and sugarcane acres are reported in **Figure 4**. In the case of sugar beets, year-to-year variation exists, but overall, indemnities today are at a comparable level to the early 2000s. Average indemnities per year from 2000 to 2011 were $35.5 million and $42.53 million from 2012 to 2024. When adjusted for inflation and framed in 2024 dollars, the same values are $57 million and $52 million, respectively.

Compared to sugar beets, indemnities paid on insured sugarcane acres are generally much lower. From 2000 to 2019, annual average indemnities were just $2.1 million (nominal dollars). From 2020 to 2023, average yearly indemnities were $22.3 million, most of which was attributable to payments made through the HIP-WI program (included in “other”). Finally, 2024 was an exceptional year, resulting in over $130 million in indemnity payments, most of which were attributable to Hurricane Francine.

Figure 4: Sugar Beet and Sugarcane Indemnities by Cause of Loss, 2000–2024



Note: Individual sources of loss attributed to “cold and freeze” are "cold wet weather", “cold winter", "freeze", and "frost". Similarly, “excess moisture” includes "excess moisture/precipitation/rain" and "flood". “heat and drought” includes "drought", "heat", and "hot wind". “hurricanes, storms, and wind” includes "hurricane/tropical depression", "wind/excess wind", "tornado", "hurricane". All other perils not listed are included in “other”.

Recent Policy Developments

Overview of Recent Policy Developments

The U.S. sugar program has been brought up several times in recent years in witness testimony as part of congressional hearings related to the Farm Bill. A recurring issue brought up in testimony delivered

on behalf of the American Sugar Alliance is that sugar loan rates should be raised to reflect the current cost of production (Deal, 2025; Frischhertz, 2023; Johansson, 2022; Rockstad, 2023). As noted earlier, the inherent price floor created by the sugar beet loan rate provides substantially less price protection today than it did in the early 2000s due to the nominal increases in the loan rate not keeping up with inflation.

Most recently, the One Big Beautiful Bill Act (United States Congress, House of Representatives, 2025) raised sugar loan rates to levels recently suggested by the American Sugar Alliance (Deal, 2025). Specifically, loan rates for raw cane sugar were raised from 19.75 cents per pound to 24 cents per pound. Loan rates for refined beet sugar were also amended and set to be 136.6% of the raw cane sugar rate. In effect, this raised the sugar beet loan rate from 25.38 cents per pound to 32.77 cents per pound (depicted in **Figure 1**). Although this represents a substantial increase to the current loan rate, recent refined sugar prices have been well above even the proposed higher rate for the last few years.

The other commonality in recent congressional testimony is the call for improvements to the available coverage options within the FCIP, with the specific request to develop a revenue protection insurance plan for sugar producers (which is already under development for sugar beet, see AgriLogic Consulting, 2025). To date, sugar producers only have access to crop insurance policies that protect against low yields (via the APH plan and supplemental SCO and ECO endorsements) and, additionally, in the case of sugarcane, the single peril index-based HIP-WI plan, which triggers based on hurricane force winds.

Critics of the existing sugar program contend that the marketing allocations and import quotas already lead to higher revenues for sugar producers (Smith & Glauber, 2022). However, typical motivations for risk management programs, like crop insurance, are centered on reducing revenue variability rather than increasing mean revenue. As a cursory assessment, we compare the volatility of raw sugar prices for both the U.S. and the rest of the world using a Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model on monthly log returns of raw sugar prices from January 2000 onward. U.S. prices were based on ICE Contract No. 16 (raw sugar, U.S. nearby futures), while world prices used ICE Contract No. 11.

Monthly returns were computed as the first difference of the log price series. We then estimated conditional volatility using a symmetric GARCH(1,1) specification with a normal distribution. The implied mean conditional volatility for the monthly world sugar prices was 7.9 compared to 3.7 for the U.S., indicating that world sugar prices have been approximately twice as volatile on a month-to-month basis over the past several decades.[3] Advocates for the sugar industry suggest this volatility on the world market is a result of subsidized sugar from foreign producers being dumped on the world market, implying that interventions are needed to maintain a stable domestic price environment (Johansson, 2022).

In such a case, the more apt comparison may be one between domestic sugar prices and the prices of other major commodities. **Table 1** repeats the analysis described above using monthly prices for eight

[3] A conditional volatility score of 7.85, as estimated by a GARCH model, represents the average magnitude of month-to-month price fluctuations (expressed as percentage changes) predicted by the model. Specifically, a value of 7.85 indicates that, on average, monthly price returns vary by roughly ±7.9%.

other major commodities (corn, soybeans, wheat, oats, barley, peanuts, rice, and sorghum) obtained from NASS. The ratio of the conditional price volatility of these commodities compared to the conditional price volatility of US sugar ranges from 1.28 (rice) to 1.95 (oats), indicating that the price volatility of these commodities is 28% (rice) to 95% (oats) higher than US sugar price volatility. In other words, US sugar producers face significantly less price volatility than other major commodities. The bottom half of **Table 1** compares world sugar prices to the same major commodities. Volatility ratios range from .61 (rice) to .92 (oats), indicating volatility that is between 61% and 92% of the volatility observed on the world sugar market. Overall, world sugar prices do appear to be more volatile than prices of major domestic commodities; however, domestic sugar prices are less volatile than both world sugar prices and prices of major US field crops.

Table 1: Comparison of Conditional Monthly Price Volatility, 2000-2024

Series 1	Volatility 1	Series 2	Volatility 2	Ratio (Vol. 2/ Vol. 1)	T Test P-value
Sugar (raw), U.S.	3.731	Sugar (raw), World	7.854	2.1054	0.0000
Sugar (raw), U.S.	3.731	Corn	5.206	1.3954	0.0000
Sugar (raw), U.S.	3.731	Soybeans	4.807	1.2887	0.0000
Sugar (raw), U.S.	3.731	Wheat	5.094	1.3654	0.0000
Sugar (raw), U.S.	3.731	Oats	7.280	1.9513	0.0000
Sugar (raw), U.S.	3.731	Barley	5.366	1.4385	0.0000
Sugar (raw), U.S.	3.731	Peanuts	6.377	1.7095	0.0000
Sugar (raw), U.S.	3.731	Rice	4.792	1.2844	0.0000
Sugar (raw), U.S.	3.731	Sorghum	6.852	1.8366	0.0000
Sugar (raw), World	7.854	Sugar (raw), U.S.	3.731	0.4750	0.0000
Sugar (raw), World	7.854	Corn	5.206	0.6628	0.0000
Sugar (raw), World	7.854	Soybeans	4.807	0.6121	0.0000
Sugar (raw), World	7.854	Wheat	5.094	0.6485	0.0000
Sugar (raw), World	7.854	Oats	7.280	0.9268	0.0000
Sugar (raw), World	7.854	Barley	5.366	0.6832	0.0000
Sugar (raw), World	7.854	Peanuts	6.377	0.8120	0.0000
Sugar (raw), World	7.854	Rice	4.792	0.6101	0.0000
Sugar (raw), World	7.854	Sorghum	6.852	0.8723	0.0000

Note: The final column presents p-values for a t-test for the null hypothesis that the mean volatility measures presented in "Volatility 1" and "Volatility 2" are not equal. In all cases, this test is rejected with p-values approximately equal to zero to 4 decimal places. Raw sugar prices were used for the comparison since spot prices are missing for refined beet sugar in some months (see figure 1). However, performing the same analysis using refined prices up to 2022 (for which monthly data is continuously available) produces mean conditional volatility measures of 4.36 (U.S. refined beet sugar), 4.21 (U.S. refined cane sugar), and 6.07 (refined world sugar).

Considerations for Sugar Beet Revenue Protection Insurance

Developing a revenue protection (RP) plan for sugar producers under the FCIP presents several structural and market-based challenges. The FCIP's actuarial process generally begins by calculating the base premium rate to cover yield risk, using standardized observed yield losses. If revenue protection is desired, an additional rate (the Revenue Protection Add-On Rate) is applied. This add-on requires a reliable estimation of price volatility, typically drawn from domestic futures markets or closely related analogues.

For many major crops like corn and soybeans, well-established domestic futures markets provide the necessary data to support revenue protection pricing. Sugar, however, is primarily traded on international platforms such as the Intercontinental Exchange (ICE), which could make it challenging to align with RMA standards for revenue insurance pricing. Due to differences in how beet sugar and cane sugar move through the supply chain, beet sugar is typically marketed as refined sugar, whereas cane sugar reaches the market as raw sugar that ultimately needs further refinement before ending up in food products.

In the case of cane sugar, ICE contract 16 prices U.S. delivery of raw cane sugar, making it a potential candidate for pricing revenue protection policies for sugar cane producers. In the case of beet sugar, however, ICE contract 16 is not a direct analog for the price of the marketed refined sugar. At the same time, sugar producers already participate widely in FCIP yield-based programs, although typically at lower coverage levels. Enrollment in available supplemental coverage options also remains limited. This raises the possibility that enhancing participation in higher coverage tiers and in supplemental plans could improve the overall risk mitigation potential with or without the introduction of an RP product.

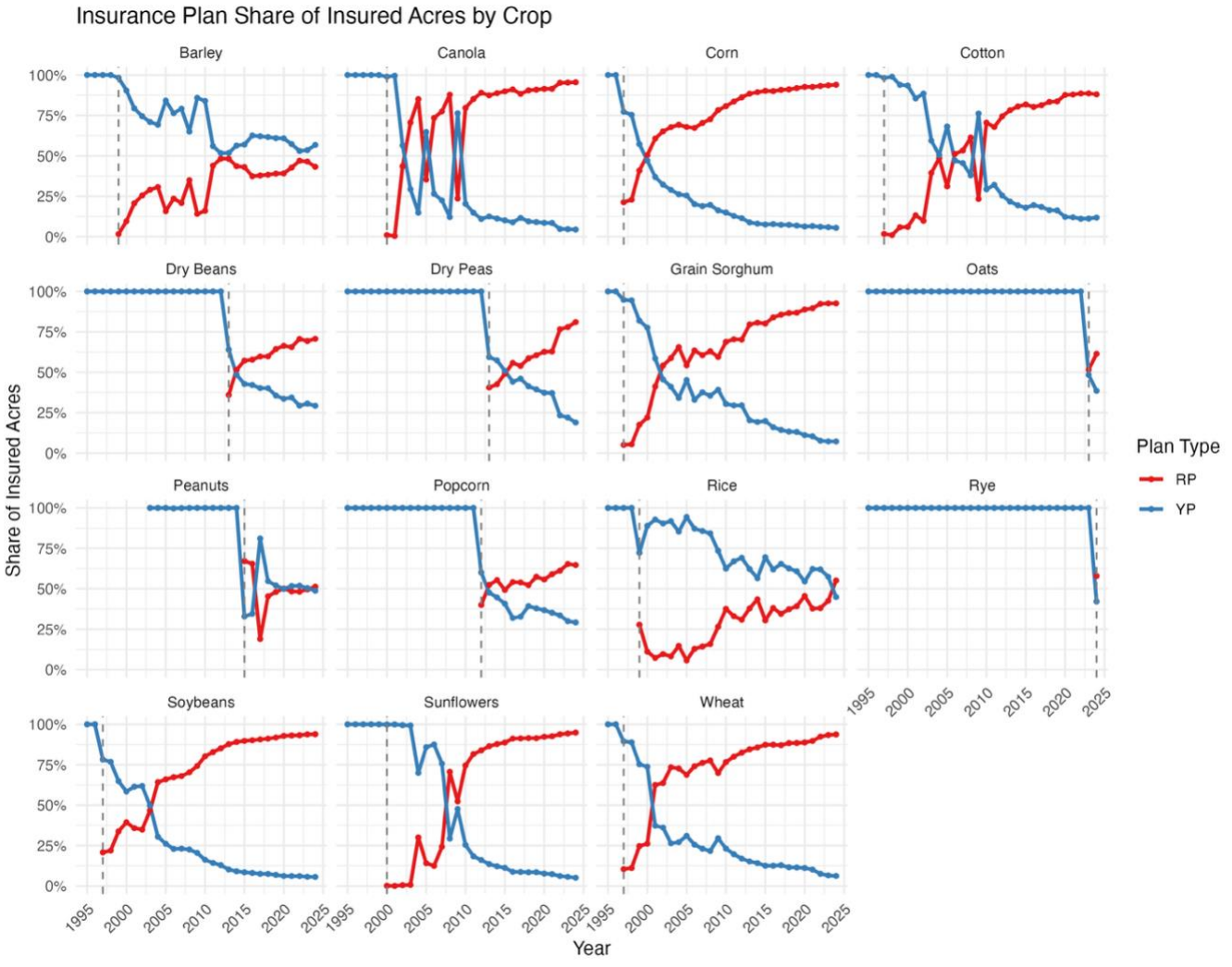
Regardless of the methods used to develop premium rates for sugar beet revenue protection insurance, the introduction of a revenue protection policy is likely to alter the rates of participation in existing yield protection policies. Since insured sugar beet acres cannot be simultaneously enrolled in a yield-based and revenue-based insurance plan, any already insured acres that enroll in a revenue protection policy necessarily reduce participation in yield-based insurance plans. This phenomenon is very apparent when looking at participation trends among other commodities.

Figure 5 plots the share of insured acres enrolled in revenue protection policies and yield protection policies for all commodities that currently have revenue protection as a policy option. The gray vertical dotted line indicates the first year a policy was offered that insured against revenue declines. In many cases, the introduction of a revenue protection policy immediately leads to sharp declines in participation in yield protection policies.[4] Since more than 90% of harvested sugar beet acres are currently insured, any enrollment in a future revenue protection plan will likely lead to declines of similar magnitude among yield protection plans. This is an important consideration when estimating the costs of a revenue product since any declines in participation in yield-based plans create offsetting cost savings.

[4] This is not universally true. Sunflowers for example were almost exclusively insured under yield protection policies for four years after revenue protection was introduced.

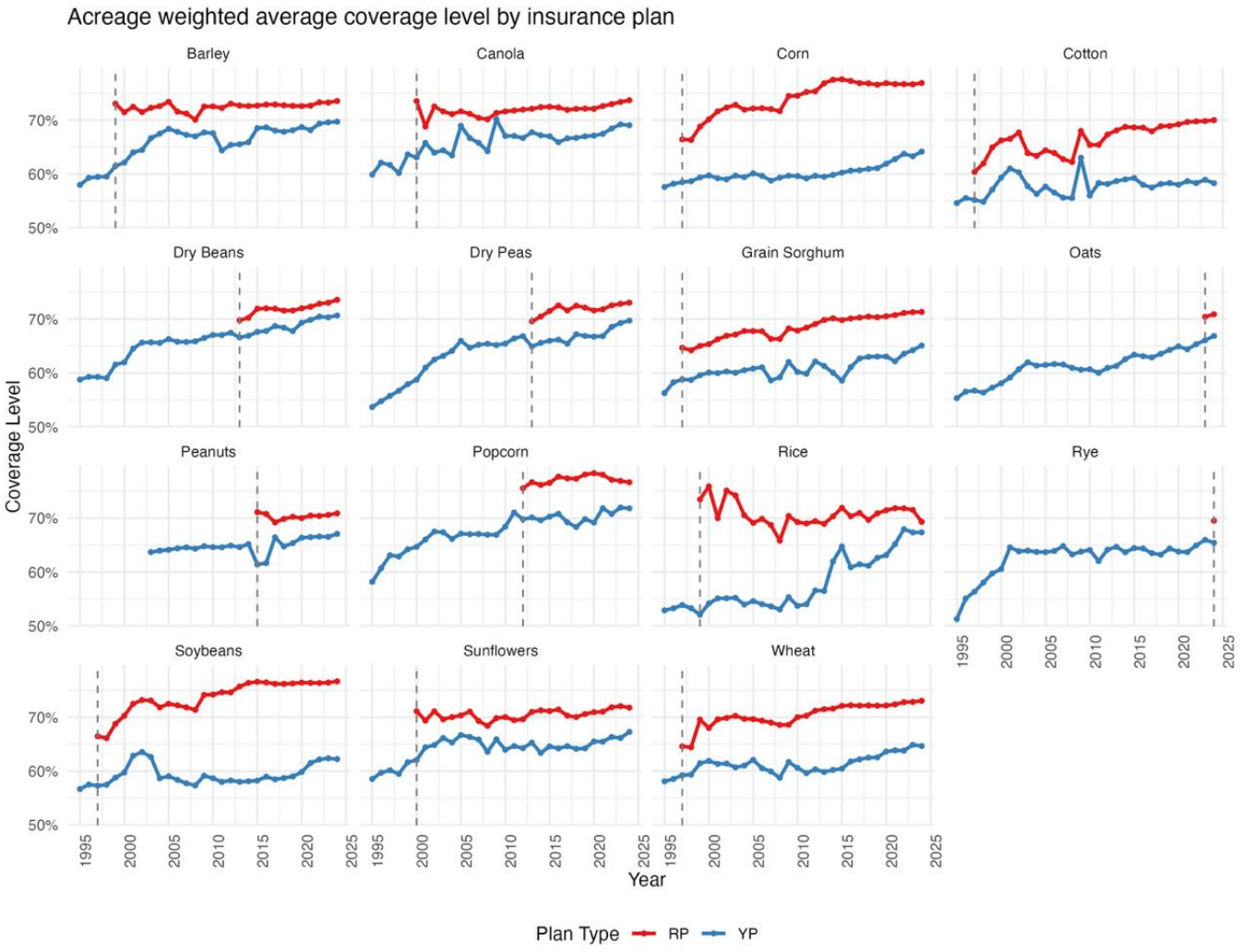
Another way that the introduction of a new insurance plan can alter the existing crop insurance market is by altering coverage levels on existing plans. This can occur if the types of producers that are inclined to purchase revenue protection policies have different preferences or attitudes towards risk than the type of producers that stay with a yield protection policy. Looking at acreage-weighted coverage levels by type of insurance plan reveals some evidence for this (Figure 6). Although the introduction of a revenue insurance plan does not appear to create a notable change in coverage levels among yield protection policies, revenue protection policies, on average, consistently are purchased at higher coverage levels. For most crops, the average difference in coverage level between RP and YP (for periods where both are available) is less than 10 percentage points. The exceptions to this are rice (12.3), corn (13.7), and soybeans (14.2).

Figure 5: Insurance Plan Share of Insured Acres by Crop



Note: YP represents acres in the Yield Protection (YP) and Actual Production History (APH) Plans. RP represents acres in Revenue Protection (RP), Revenue Protection with Harvest Price Exclusion (RPHPE), Crop Revenue Coverage (CRC), Revenue Assurance (RA), and Income Protection (IP) Plans. The gray dotted line represents the first year any type of revenue coverage was offered for that crop.

Figure 6: Acreage Weighted Average Coverage Level by Insurance Plan

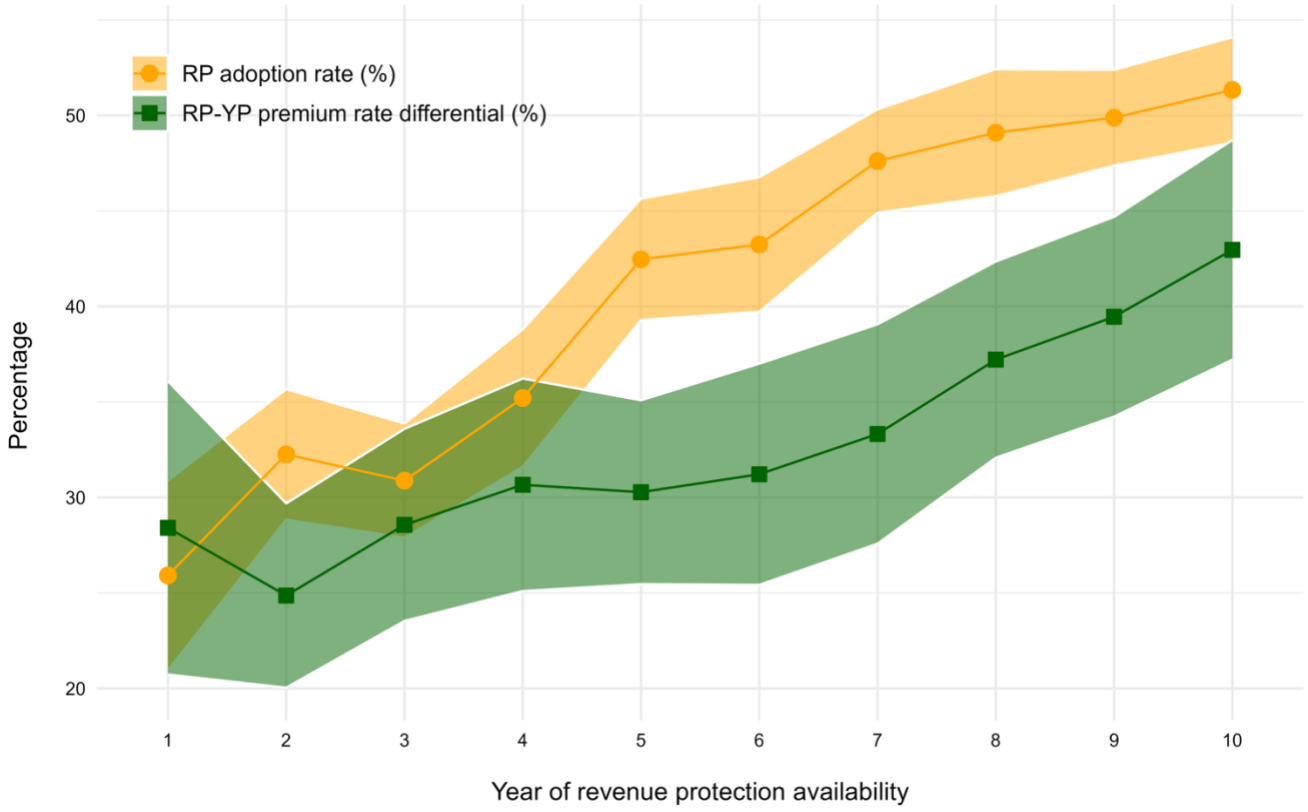


Note: YP represents acres in the Yield Protection (YP) and Actual Production History (APH) Plans. RP represents acres in Revenue Protection (RP), Revenue Protection With Harvest Price Exclusion (RPHPE), Crop Revenue Coverage (CRC), Revenue Assurance (RA), and Income Protection (IP) Plans. The gray dotted line represents the first year any revenue coverage was offered for that crop.

By using the historical trends that occur in response to revenue protection being introduced to other commodity markets, it is possible to calibrate a simulation model to project expected costs associated with the introduction of a sugar beet revenue insurance product. To do this, we look at each state and commodity and identify the first year that any acres were insured under a revenue protection plan. We then calculate acreage weighted means at the state-commodity-coverage level-year level for the RP adoption rate (RP acres divided by the sum of RP and YP acres) and average premium rate for RP and YP (total premium divided by liability). To account for the uncertainty in how a given commodity market responds to the introduction of an RP plan (i.e., every commodity has a different adoption pattern), we run a bootstrap simulation that entails drawing, with replacement, from the acreage weighted means described above.

This exercise provides us with a description of how a typical FCIP portfolio evolves after the introduction of a revenue protection policy, including the rate at which revenue protection is adopted and the average premium rate differential between RP and YP policies. **Figure 7** depicts these metrics for the first 10 years after RP is introduced. On average (across all commodity markets, states, and coverage levels), RP represents approximately 26% of the total insured acres among RP and YP in the first year it is introduced (corresponding to a simultaneous decline in YP acres). At 10 years post-introduction of RP, the average observation (defined by state and commodity) has an approximate 50-50 split of insured acres in RP and YP. The premium rate differential between RP and YP follows a similar trajectory, with RP premium rates being just under 30% higher than YP premium rates at initial introduction and rising to approximately 43% above YP rates 10 years out. The fact that the premium rate differential increases over time could be due to several factors, such as characteristically different types of acres enrolling in RP (i.e., riskier acres), increased price volatility over time, or changes to the premium rating methods[5].

Figure 7: Average Evolution of RP Adoption and RP-YP rate differences



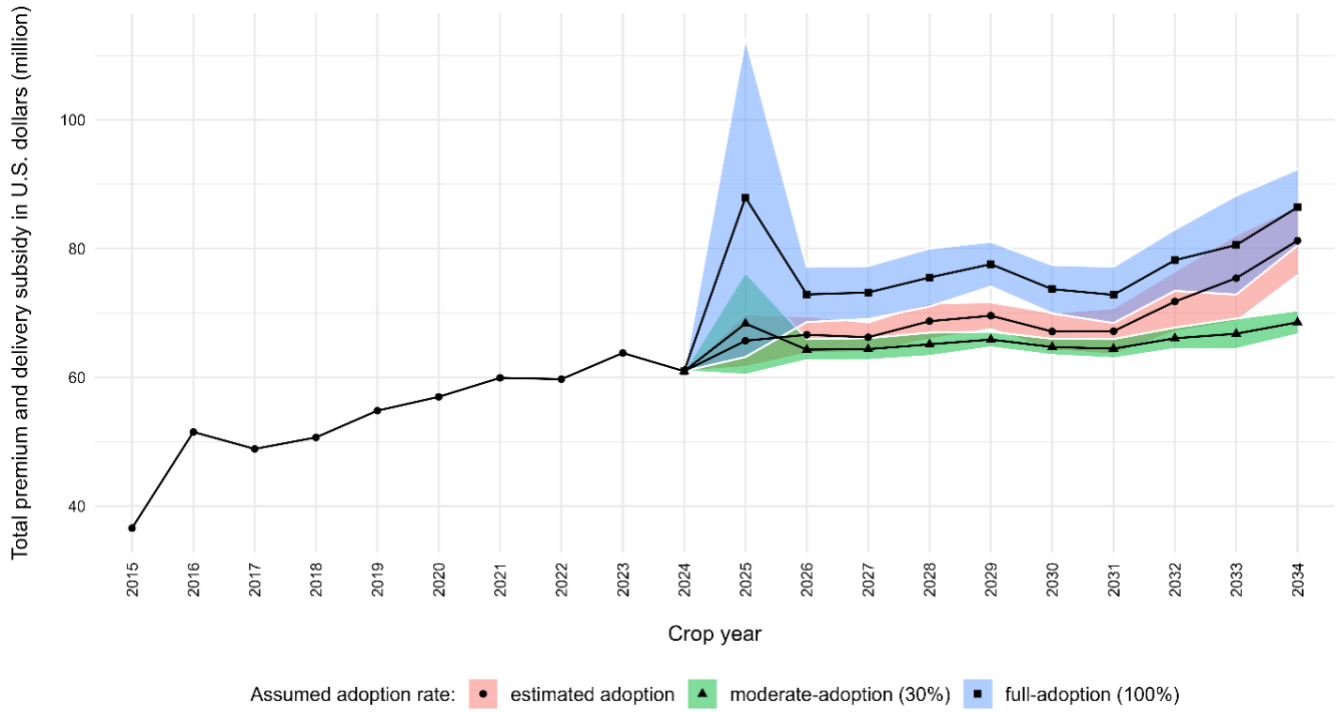
Note: RP adoption rate and RP-YP premium rate differential represent average values in the years following RP introduction for all crops with current RP availability.
Source: Author simulations using data from USDA.

[5] It's worth noting that for many crops, policies that protect against declining revenues were introduced under a different premium rating framework than what is utilized today.

The adoption dynamics between RP and YP depicted in **Figure 7** can be combined with existing observational data to construct cost projections under a scenario where a revenue protection policy is introduced for sugar beets. Using data from RMA, we establish a baseline using 2024 crop year data, which includes total insured acreage, the distribution of participation across coverage levels, current YP premium rates, current subsidy levels, and Administrative and Operating (A&O) expense ratios. These values are subsequently held constant to isolate the effect of shifting away from YP to RP. Total costs associated with insured sugar beet acres are then calculated from 2025 to 2034 under a scenario where an RP insurance plan is made available in 2025.

These costs are calculated using the projected paths depicted in **Figure 7** to calculate total premiums associated with YP and RP, which are then used to calculate total premium subsidies and A&O expenses. These cost projections are depicted in **Figure 8**. Data points before 2025 represent the observed cost of YP for sugar beets, whereas data points from 2025 onward represent the combined cost of YP and RP for sugar beets. Costs associated with the adoption path depicted in Figure 8 are represented by the red region, which ranges from $67 million in 2025 to $82 million in 2034 (all in 2024 dollars). For context, the current 2024 cost associated with YP 2024 is $61 million. This projected cost path, however, assumes that the adoption of a sugar beet revenue product would be like the adoption of RP in other commodity markets.

Figure 8: Projected Costs for Sugar Beet YP and RP plans



Note: Projected costs represent the entire cost of providing both YP and RP plans, meaning the marginal cost of introducing RP is equivalent to the projected cost minus $61 million (the baseline 2024 cost of providing YP only).

For reasons touched on earlier, the sugar market is unique and may not necessarily follow previous adoption trends. To establish a credible projected cost range, we also assume a fixed adoption rate for the whole projection period of 30% RP (on the low end, “moderate-adoption”) and 100% RP (on the high end, “full-adoption”). These assumptions produce cost estimates of $71 million - $94 million (in 2025) and $82 million - $87 million (in 2034).

Looking at how commodity markets have responded to the introduction of RP policies serves as a helpful starting point for estimating costs associated with providing revenue protection policies for sugar beet producers. However, as discussed throughout this report, the policy environment surrounding sugar is unique, and whether past introductions of RP serve as useful representations for how adoption within the sugar beet market will unfold is unclear. To that point, several limitations in the above simulation analysis are worth highlighting. First, as depicted in **Figure 6**, coverage levels under RP tend to be slightly higher than YP. This fact is not accounted for in this analysis, which could mean the projected costs are slightly understated since higher coverage levels generally are associated with higher premiums (and thus premium subsidies).

At the same time, price volatility for domestic sugar is lower than that of other domestic commodities, which would suggest premium rates for RP will be lower for sugar beets than for other commodities. In this case, the premium rate differentials between RP and YP used in the simulation (which are based on other commodity markets) would be slightly higher than expected. Finally, because outcomes are acreage weighted and averaged over states, commodities with more geographic dispersion and more acreage tend to exert more influence over the estimated adoption paths in **Figure 7**.

Conclusion

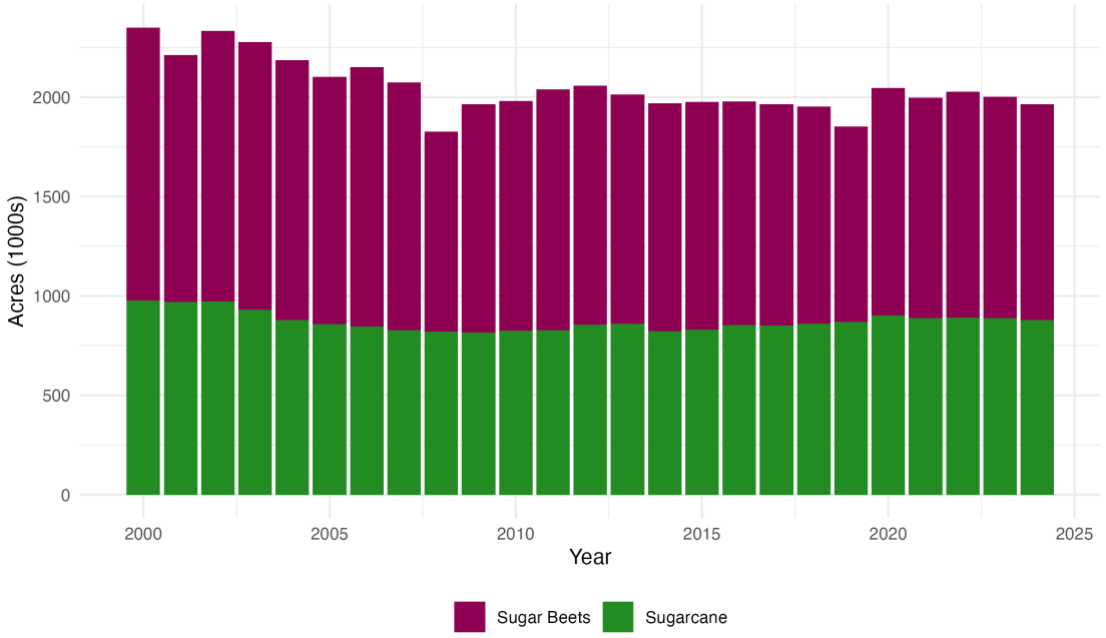
The U.S. sugar industry plays a key role in domestic agricultural production, consistently contributing to the nation's sugar supply and the economies of key producing regions. Despite gradual declines in harvested acreage, steady increases in yields have maintained overall sugar production levels. The current U.S. sugar policy environment is characterized by mechanisms such as tariff-rate quotas, marketing allotments, and nonrecourse loans, which collectively stabilize sugar prices. Recent policy debates have highlighted concerns that nominal adjustments to sugar loan rates have not kept pace with inflation, effectively reducing their protective value. Recent adjustments to sugar loan rates made by the recently passed One Big Beautiful Bill Act have addressed this concern to some degree. An analysis comparing U.S. and global sugar price volatility demonstrated that domestic sugar prices are significantly less volatile than world market prices and prices of other major U.S. commodities, such as corn and soybeans, meaning the relative price risk faced by U.S. sugar producers is lower than that for most major field crops. This, coupled with the industry’s reliance on international markets for futures pricing, means existing RMA methodology for setting premium rates on revenue protection policies may not be generally applicable without modification (particularly in the case of beet sugar, which is marketed as refined sugar).

Historical analysis from other commodities demonstrates that the introduction of revenue-based insurance policies typically leads to significant shifts away from existing yield-based plans, which have an offsetting effect in terms of the total cost associated with introducing revenue protection into a commodity market. The simulations performed in this report suggest that the introduction of an RP

policy for sugar beets could result in additional FCIP costs (premium subsidies and administrative and operating expenses) ranging from approximately $67 million to $82 million annually (in 2024 dollars) over the next decade, assuming adoption patterns mirror those observed for other commodities. However, given the unique attributes of the sugar market, the actual fiscal impact could vary from these projections if the adoption rate for revenue protection insurance differs from that observed in other commodity markets.

Appendix

Figure S1: Sugar Beet and Sugarcane Harvested Acres in the U.S., 2000-2024

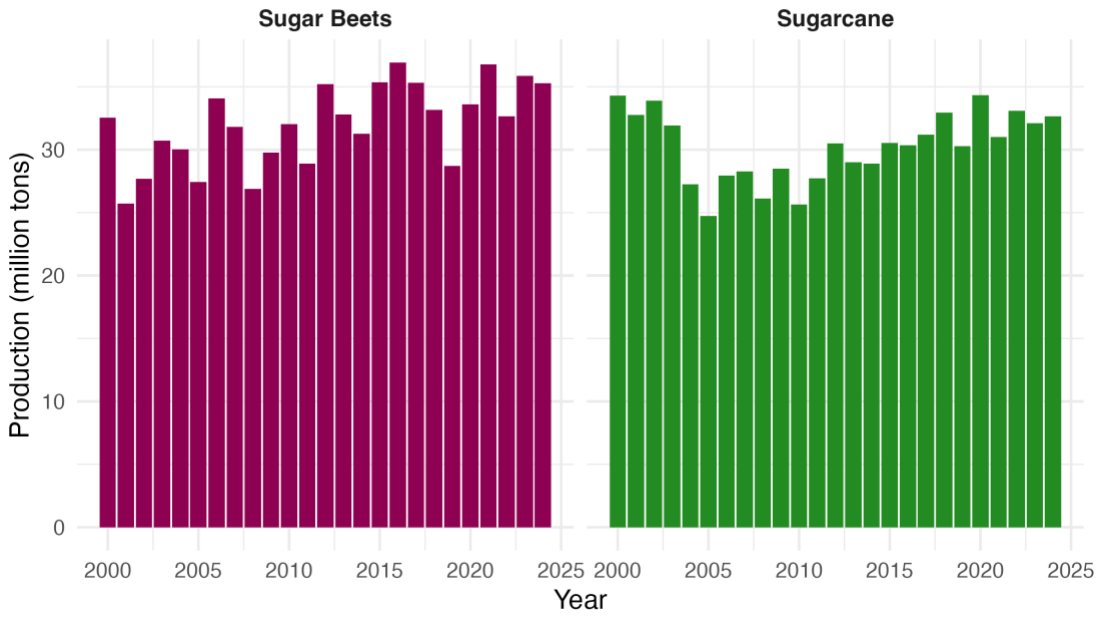


Source: Author construction using data from the USDA.

Figure S2: Sugar Beet and Sugarcane Yields in the U.S., 2000–2024

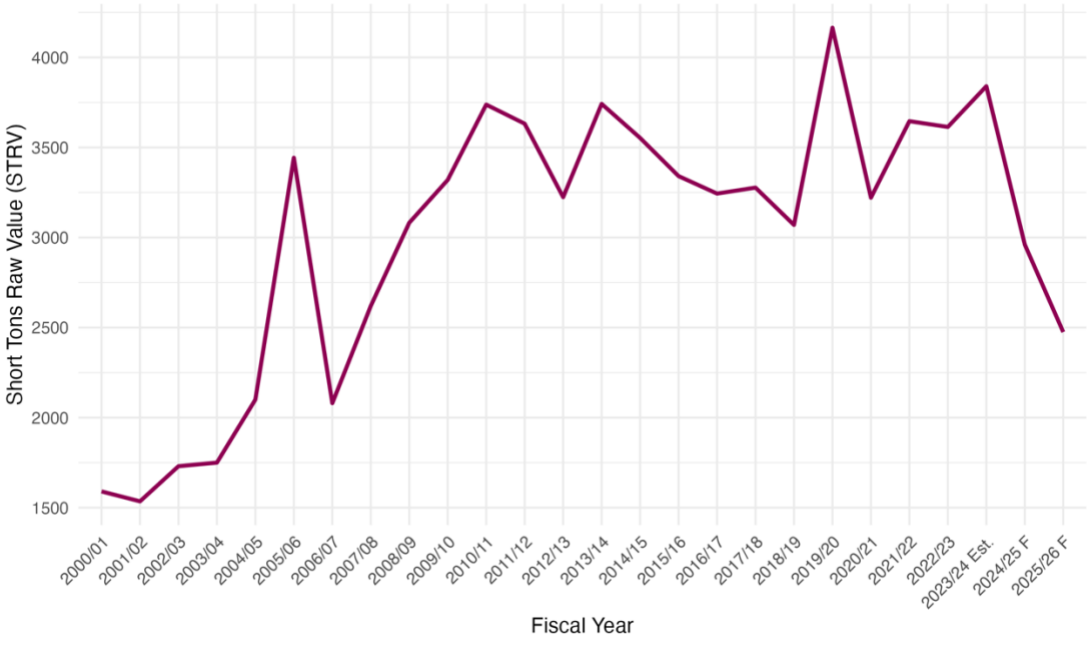
Source: Author construction using data from the USDA.

Figure S3: Sugar Beet and Sugarcane Production in the U.S., 2000–2024



Source: Author construction using data from the USDA.

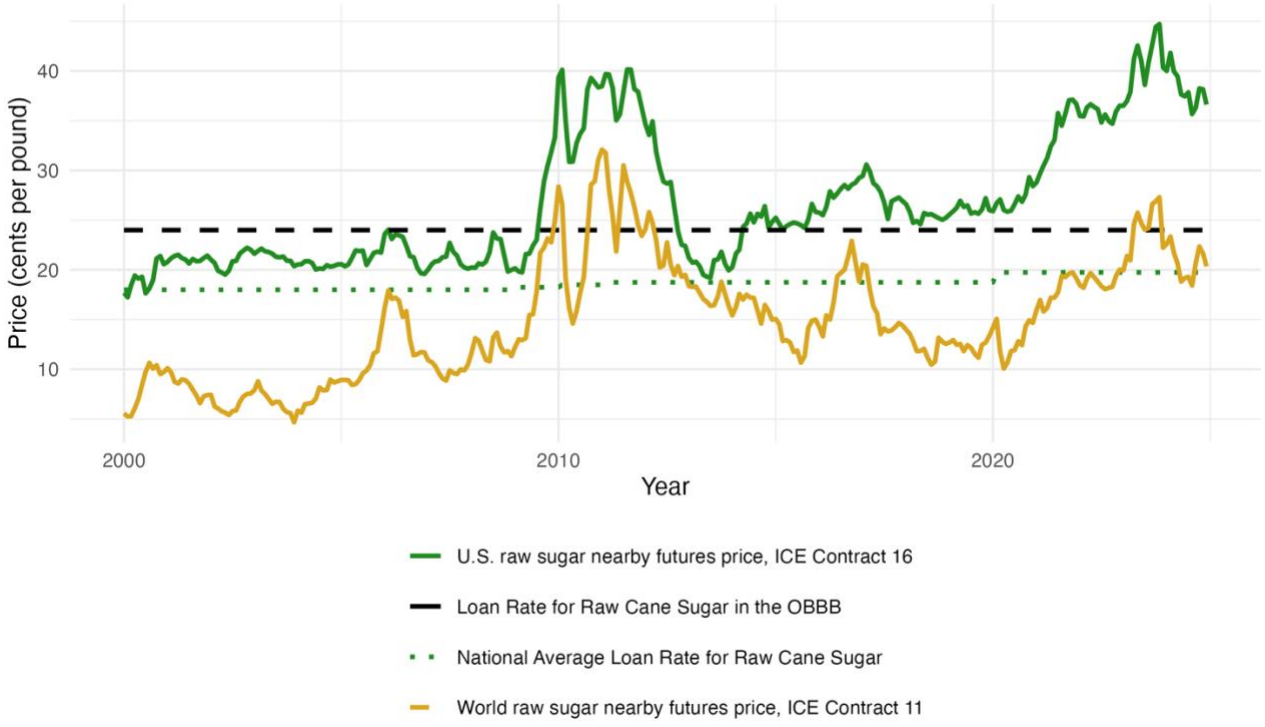
Figure S4: U.S. Sugar Imports (short tons, raw value)



Note: Est. = Estimated, F = Forecasted.

Source: Author construction using data from the USDA.

Figure S5: Monthly U.S. and World Raw Sugar Prices, 2000–2024



Note: ICE = "Intercontinental Exchange". OBBB = "One Big Beautiful Bill".

Source: Author construction using data from the USDA.

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Disclaimer

This report is intended to inform ongoing discussions related to risk management for sugarbeet producers. The analysis, findings, and conclusions represent the interpretation of the authors and do not necessarily reflect the views of any affiliated institution. The authors are solely responsible for any errors or omissions. Users of this report are encouraged to consult additional data sources and expert perspectives when forming policy, legal, or business decisions.

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