



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.



Economic Consequences of Capping Premiums in Crop Insurance

David Bullock and Sandro Steinbach

Department of Agribusiness and Applied Economics
North Dakota State University

June 5, 2023

farmdoc daily (13): 102

Recommended citation format: Bullock, D. and S. Steinbach. "Economic Consequences of Capping Premiums in Crop Insurance." *farmdoc daily* (13): 102, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, June 5, 2023.

Permalink: <https://farmdocdaily.illinois.edu/2023/06/economic-consequences-of-capping-premiums-in-crop-insurance.html>

The study analyzes the economic consequences of capping farmer premiums for crop insurance offered by the USDA Risk Management Agency (USDA-RMA). A cap on the premium-to-liability ratio of 4.0% would lower the premiums for farmers, with the most benefit flowing to those who use high coverage levels and produce cotton, corn, wheat, and soybeans in Texas, the Dakotas, and Kansas. Capping farmer premiums would not only provide relief to farmers by lowering their insurance premiums but also contribute to enhanced farm revenue. This policy change would promote a stable food supply and potentially lower consumer prices.

The USDA-RMA supports the insurance premiums paid by farmers and ranchers, with a substantial subsidy amounting to \$11.6 billion in 2022. The average premium-to-liability ratio for all participating farmers was 5.0% when opting for the highest level of coverage (85%). In contrast, the ratio was 3.0% for the three lower coverage levels (70, 75, and 80%). To alleviate the premium burden on farmers, the study proposes capping the ratio at 4.0% through additional premium subsidies. By implementing this adjustment, a reduction of 8.0% in farmer premiums can be achieved, with an estimated cost of \$186.0 million based on the coverage and participation levels observed in 2022. The primary beneficiaries of this policy change would be farmers with coverage levels exceeding 70%, who would witness an average reduction of \$1.40 per acre in their insurance premiums.

The commodities that would experience the largest benefits from the proposed adjustment include cotton (\$66.4 million), corn (\$58.1 million), wheat (\$23.3 million), and soybeans (\$22.1 million). In terms of regional distribution, the additional premium subsidies would primarily benefit farmers in Texas (\$69.8 million), followed by North Dakota (\$16.0 million), South Dakota (\$14.2 million), and Kansas (\$13.8 million). Overall, capping the premium-to-liability ratio at 4.0% would not only provide relief to farmers by lowering their insurance premiums but would also contribute to enhanced farm revenue. This policy change would promote a stable food supply and potentially lower consumer prices.

Background

Over the past three decades, the U.S. federal crop insurance program has experienced significant growth, leading to increased coverage, greater liability, and higher insurance subsidies. This program is crucial in

We request all readers, electronic media and others follow our citation guidelines when re-posting articles from farmdoc daily. Guidelines are available [here](#). The farmdoc daily website falls under University of Illinois copyright and intellectual property rights. For a detailed statement, please see the University of Illinois Copyright Information and Policies [here](#).

helping farmers and ranchers manage the risks associated with lower crop yields and revenue. The program is managed by the USDA Risk Management Agency (USDA-RMA) and the Federal Crop Insurance Corporation (FCIC), with private insurance providers offering and distributing crop insurance products to farmers. The government funds the program's administrative and operational costs, reinsurance expenses, and insurance premiums.

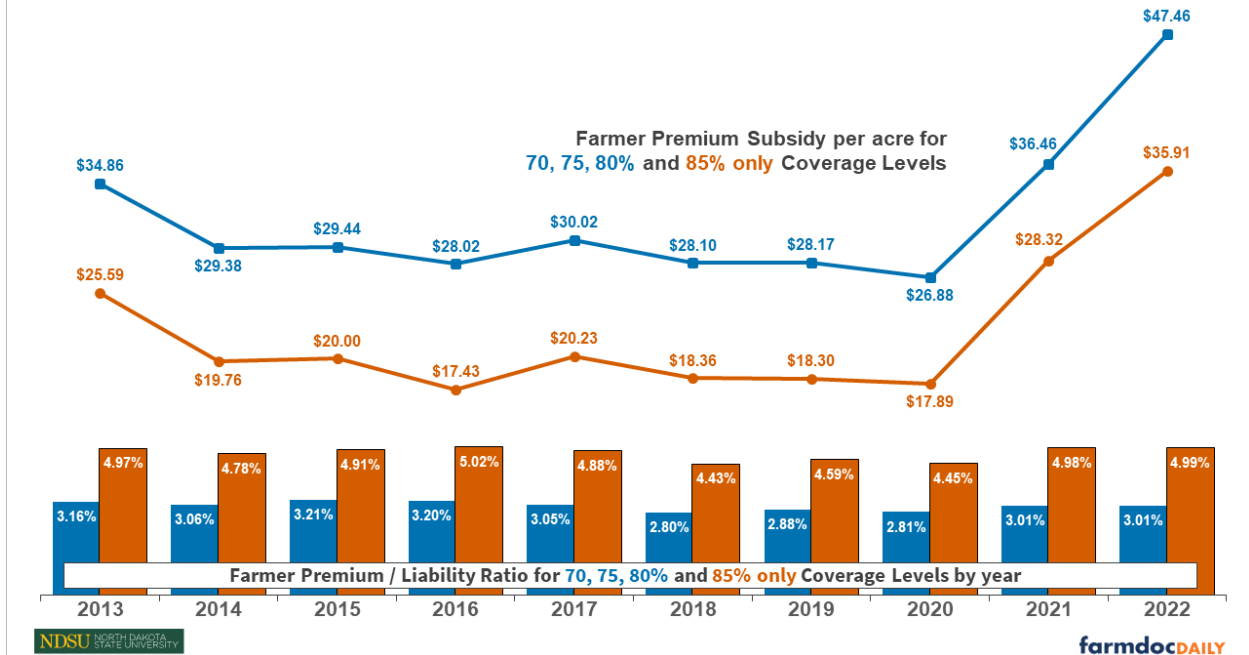
Crop insurance products are developed by either the FCIC or private insurance companies, subject to approval by the FCIC. The FCIC and USDA-RMA determine and regulate the premiums for these insurance products. Premiums are based on the insured liability amount, historical yield experience, and market prices. Over time, the rating process has undergone multiple revisions to ensure premium rates are actuarially fair. In 2022, the most popular crop insurance products for major field crops were Yield Protection (YP) and Revenue Protection (RP), accounting for around 80% of the total liability. YP, previously known as Actual Production History (APH), provides compensation when the actual yield is lower than the historical average yield. On the other hand, RP pays out when the actual yield multiplied by the harvest price is less than the historical average yield multiplied by the higher of either the projected price or the harvest price. As a result, premium rates for revenue protection are generally higher than those for yield protection per dollar of liability.

The premium a farmer pays is the difference between the total premium and the premium subsidy. The total premium is calculated by multiplying the premium rate by the insured liability, representing the maximum compensation available. The insured liability depends on factors such as the insured acreage, chosen coverage levels, insured price of the crop, and historical crop yield. The USDA-RMA establishes the premium rate for crop insurance, considering factors such as the level of risk associated with the insured crop in the county, the farm's chosen coverage level, the insurance product, and specific farm practices like irrigation. The agency aims to set actuarially fair premium rates corresponding to the expected indemnities per dollar of liability. Therefore, premium rates are typically higher for riskier crops grown in higher-risk counties.

The premium subsidy is calculated by multiplying the subsidy rate by the total premium. Subsidy rates vary depending on the crop insurance product, coverage level, and unit type. Each crop has the same subsidy rate across insurance products for a given coverage level and unit type. Group or area-based products linked to county-level yields or revenue have higher subsidy rates and indemnity payout schedules. If the premium rate were actuarially fair, the expected net profit gain for a farm from purchasing insurance would equal the premium subsidy. The subsidy per dollar of insured liability determines the subsidy received by participating farmers.

The total subsidy for crop insurance premiums experienced significant growth, rising from \$205 million in 1989 to \$11.6 billion in 2022, reflecting the increased availability of crop insurance options for farmers. Figure 1 shows the farmer premium subsidy and the farmer premium/liability per acre between 2012 and 2022. From 2013 to 2020, the average subsidy per acre for farmers choosing coverage levels between 70 to 80% was \$29.40, whereas, for the 85% coverage level, it was only \$19.70. As a result, the subsidy per acre at the 70 to 80% coverage levels was 49.1% higher than the 85% coverage level. Both subsidy rates have increased by 61.9 and 54.8%, respectively, since the beginning of the pandemic. This difference suggests that the ratio of farmer premiums to liabilities is significantly higher at the 85% coverage level (5.0%) compared to the 70 to 80% coverage levels (3.0%). Consequently, the premium costs for crop insurance in counties with higher risk are considerably higher, making it less affordable for farmers to opt for higher coverage levels in counties with climatic disadvantages.

Figure 1. Farmer Premium Subsidy and Farmer Premium/Liability per Acre by Year



Approach and Data

We conducted our analysis using county-level crop insurance data for 2013 to 2022 from the USDA-RMA. Our analysis focused on the APH, RPHPE, RP, and YP insurance plans, considering different unit structures such as enterprise units, enterprise units separated by cropping practice, and enterprise units separated by irrigation practice. By utilizing the crop insurance data from 2022, we estimated the economic impact of restricting the farmer premium-to-liability ratio to 4.0% for enterprise units. Furthermore, we examined the distributional consequences based on the coverage level, commodity, and state.

Results

The results of our analysis using crop insurance data for 2022 show that if the farmer premium to liability ratio for crop and revenue insurance is limited to 4.0% for enterprise units, the average farmer premium will decrease by 8.0%, amounting to a total cost of \$186.0 million based on the coverage levels in 2022. The additional subsidy would primarily benefit farmers with coverage levels above 70%, with 97.0% of the subsidy going to them. This would result in an average reduction in farmer premiums from \$18.20 to \$16.70 for coverage levels between 70% and 85%. The premium reduction would be highest for farmers with a 70% coverage level, followed by those with 85% coverage levels. In terms of the distribution of subsidies across coverage levels, farmers insured at the 75% coverage level would receive the largest share of the subsidy (27.3%), followed by those at the 80% (25.8%), the 70% (23.4%), and the 85% (20.1%) coverage levels.

The additional subsidy required to limit the farmer premium to liability ratio to 4.0% varies across commodity groups, as shown in Table 1. Cotton would benefit the most from this adjustment, receiving \$66.4 million in additional subsidy, followed by corn (\$58.1 million), wheat (\$23.3 million), and soybeans (\$22.1 million). Farmers insured at the 70% and 75% coverage levels would receive the largest increase in subsidy for cotton, while corn farmers would see higher subsidy increases at the 80% and 85% coverage levels. Wheat farmers insured at the 75% coverage level and soybean farmers at the 85% coverage level would benefit the most. This distribution reflects the spatial nature of yield and revenue risk across commodities and coverage levels.

Table 1. Added Subsidy Based on the 2022 Participation Levels for Top 4 and All Other Commodities

Coverage Level	Cotton	Corn	Wheat	Soybeans	All Others	Grand Total
50%	\$16,278	\$34,394	\$42,229	\$12,101	\$29,047	\$134,048
55%	\$2,928	\$15,754	\$2,257	\$2,389	\$18,642	\$41,969
60%	\$1,471,554	\$88,371	\$224,772	\$18,042	\$83,394	\$1,886,134
65%	\$2,582,560	\$190,596	\$522,936	\$47,287	\$166,207	\$3,509,586
70%	\$35,976,337	\$1,867,751	\$3,733,959	\$366,086	\$1,531,834	\$43,475,966
75%	\$20,524,940	\$11,541,018	\$8,978,372	\$2,327,630	\$7,350,844	\$50,722,804
80%	\$4,189,298	\$24,832,206	\$5,423,188	\$8,808,374	\$4,675,859	\$47,928,926
85%	\$1,630,437	\$19,487,160	\$4,355,633	\$10,560,851	\$2,295,039	\$38,329,119
Grand Total	\$66,394,332	\$58,057,250	\$23,283,346	\$22,142,759	\$16,150,864	\$186,028,552



The distribution of additional subsidies across states is influenced by the spatial pattern of yield and revenue risks as well as coverage levels, as shown in Figure 2. Texas farmers would receive the majority of the additional subsidies (\$69.8 million), followed by farmers from North Dakota (\$16.0 million), South Dakota (\$14.2 million), and Kansas (\$13.8 million). Interestingly, when considering the additional subsidy per acre, Texas farmers would receive an average of \$8.57 per acre, while Oklahoma, Washington, and Oregon would receive approximately \$3.40 per acre (see Figure 3). The additional subsidy would primarily benefit states that produce cotton, corn, wheat, and rice, while states focusing on other commodities would receive fewer additional subsidies.

Figure 2. Total Subsidy by State in Million Dollars

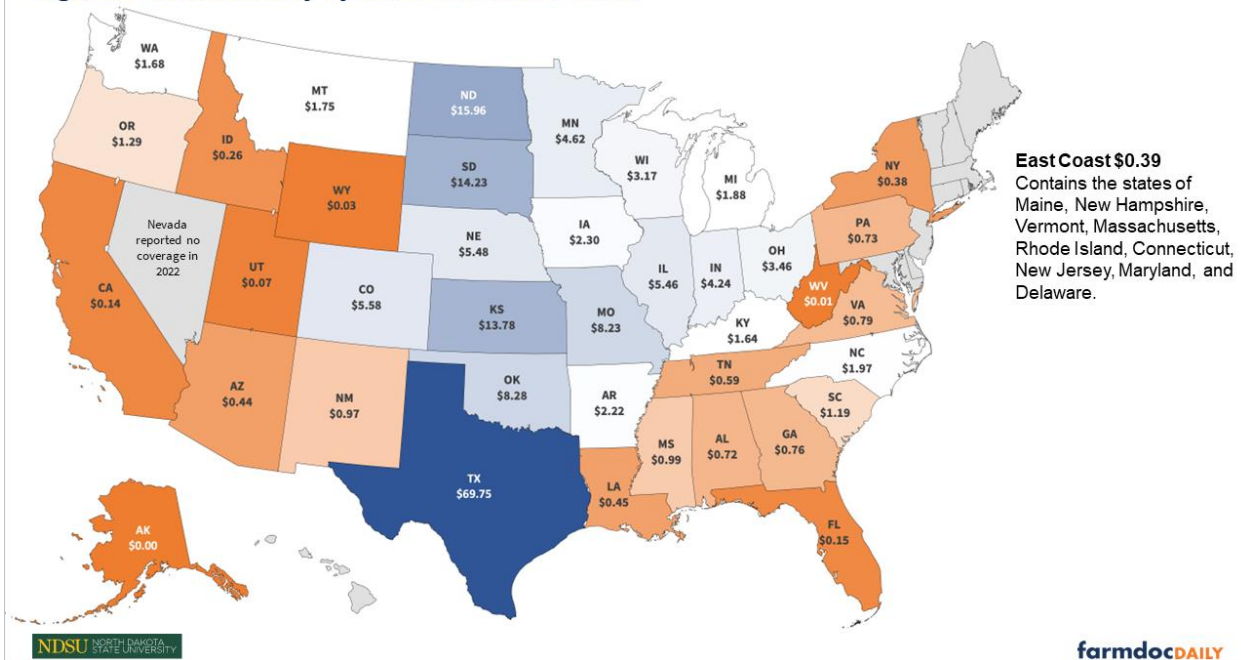
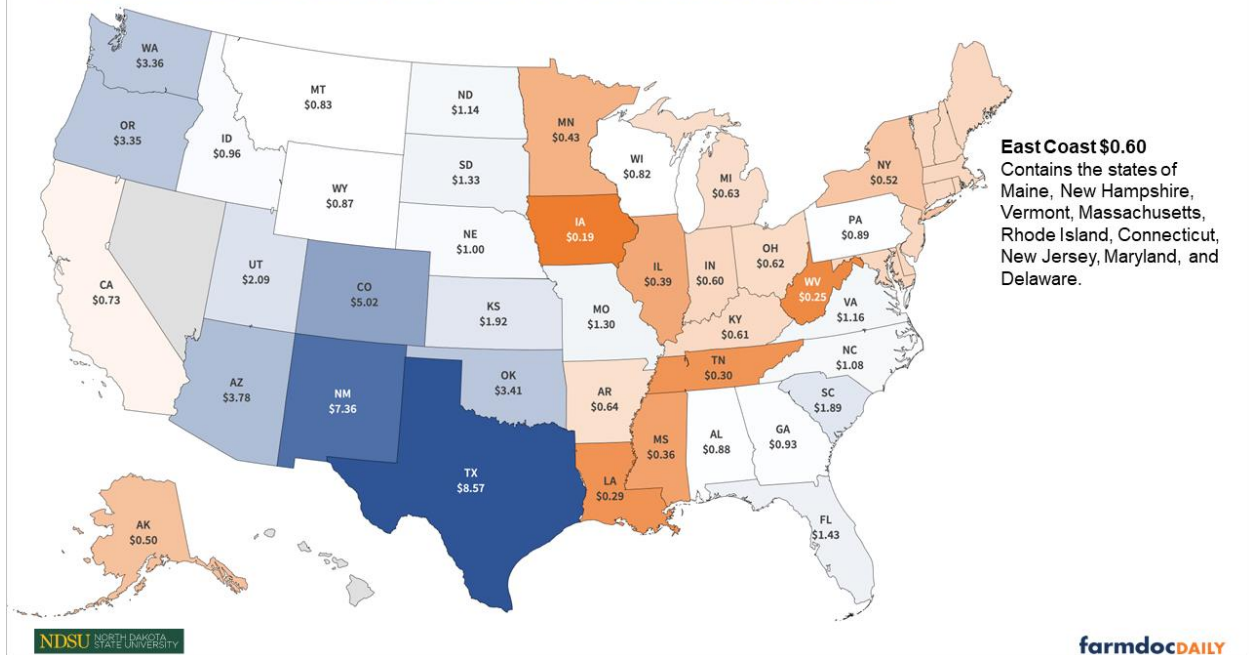


Figure 3. Additional Subsidy in Dollars per Acre of Coverage by State



It is important to note that these findings are based on the assumption that the distribution of coverage levels purchased by farmers remains fixed at 2022 levels. However, if farmers used the savings from reduced premiums to purchase higher coverage levels, additional adjustments to the acreage distribution would be necessary. This implies that higher coverage levels could become more appealing for crop insurance.

Conclusion

The federal crop insurance program plays a crucial role in helping farmers and ranchers mitigate the risks associated with crop yields and revenue fluctuations. However, the distribution of farmer premiums per liability varies significantly across different coverage levels. To address this issue, our study explores the implications of limiting the farmer premium per liability ratio to 4.0% for enterprise units with major crop and revenue insurance types. The results of our modeling indicate that such a change would lead to an 8.0% decrease in farmer premiums, primarily benefiting those with coverage levels above 70%. Specifically, cotton, corn, wheat, and soybean farmers would experience the most significant benefits, with Texas farmers receiving the highest additional subsidies, followed by those in North Dakota, South Dakota, and Kansas.

This study suggests that the current distribution of farmer premiums per liability in the federal crop insurance program is unequal across different coverage levels. The proposed adjustments to the program would particularly benefit farmers with coverage levels above 70%, which is significant considering that these farmers face the greatest risks of crop or revenue losses. Furthermore, the study emphasizes the importance of considering the effects of program changes on different commodities and states. Additionally, the analysis suggests that the proposed change could incentivize farmers to allocate more of their acreage to higher coverage levels, thereby enhancing their risk management strategies. Overall, the study offers valuable insights into the distributional consequences of the federal crop insurance program and highlights the potential advantages of program modifications to achieve greater equity for farmers and ranchers.