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Tariff Retaliation Threats and Potential Economic Impacts on North Dakota Agriculture

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U.S. agriculture faces heightened exposure to retaliatory trade actions. This report evaluates the potential risks to U.S. and North Dakota agriculture under four trade policy scenarios involving Canada, Mexico, and China. We quantify trade risks across key commodities using detailed trade elasticity estimates and projected agricultural export data. The results show that soybean and wheat exports are particularly vulnerable, with southeastern and north-central counties in North Dakota projected to experience the greatest economic impact. These findings underscore the substantial vulnerability of North Dakota's agricultural economy to retaliatory tariffs and highlight the need for targeted risk mitigation strategies that enhance market resilience, stabilize farm revenues, and reduce dependence on a narrow set of export markets.

The U.S. administration imposed a 25% ad valorem tariff on most imports from Canada and Mexico in February 2025. In response, Canada has imposed tariffs on over $100 billion worth of U.S. goods, with an initial wave of $21 billion already in effect, primarily targeting U.S. agricultural products such as orange juice, peanut butter, wine, spirits, beer, and coffee. Mexico has also suggested introducing retaliatory tariffs, though details remain limited. Meanwhile, tariffs on Chinese imports, initially set at 10% in February 2025, were later increased, leading to a tit-for-tat tariff retaliation scenario. China further escalated its response by raising tariffs on key U.S. agricultural exports, including soybeans, pork, and beef.

Building on insights from the 2018 trade war, during which the U.S. imposed tariffs based on national security concerns and affected countries retaliated with tariffs on U.S. agricultural exports, and considering recent policy measures, we outline four possible scenarios for U.S. agriculture, summarized in **Table 1**. In scenarios 1 to 3, the U.S. imposes import tariffs, as proposed, on Canada, Mexico, and China, one country at a time, triggering tit-for-tat retaliation. In the fourth and last scenario, the U.S. simultaneously increases import tariffs on China, Canada, and Mexico, and all affected trading partners impose retaliatory tariffs on U.S. agricultural exports.

Table 1. Summary of Trade Policy Scenarios

Scenarios	U.S. Action	Retaliation
Scenario 1	25% import tariff increase on all Canadian goods.	25% retaliatory tariff on U.S. agricultural goods.
Scenario 2	25% import tariff increase on all Mexican goods.	25% retaliatory tariff on U.S. agricultural goods.
Scenario 3	10% tariff increase on all Chinese goods.	10% retaliatory tariff on U.S. agricultural goods.
Scenario 4	25% tariff increase on all Canadian and Mexican goods; and a 10% on all Chinese goods.	25% retaliatory tariff from Canada and Mexico, and a 10% from China on U.S. agricultural goods.

Potential Risks to U.S. Agriculture

Table 2 presents the potential losses in U.S. agricultural commodity exports under the assumption that retaliatory tariffs target the U.S. agricultural sector. It provides estimates for the 10 most exported U.S. agricultural commodities, categorized under the BICO-HS6 classification.[1] Additionally, it includes an 11th category that covers all other agricultural products, allowing for a total estimate.[2] In addition to the retaliatory tariff assumptions for each country, we use three different factors for the estimations.

- Baseline projection for 2025: Baseline commodity export projections for 2025 are derived from the USDA's World Agricultural Outlook Board report (2025). For commodities not included in the USDA (2025) projections, values are estimated using a linear trend based on historical data from 2019 to 2023. Historical trade values are sourced from U.S. Census Bureau data via USDA FAS (2025). For a more detailed explanation of the methodology, including the process of transforming projected farm prices into export prices and the linear trend estimation, please see Kim et al. (2024).
- Tariff elasticities: We use product-level tariff elasticities from Grant et al. (2021) for commodities with estimates available in the trade war literature. For commodities not covered in this literature, we rely on industry-level (food) tariff elasticities from Raimondi & Olper (2011). Both sources are widely recognized for agricultural tariff elasticities and have been used in similar academic studies. To reflect potential outcomes within a reasonable range, we calculate lower and upper bounds for

[1] These represent commodity groups rather than individual products. For example, wheat includes HS codes 100190-100199 (common wheat) and HS codes 100110-100119 (durum wheat). Definitions for product groups can be found here: https://apps.fas.usda.gov/gats/ProductGroup.aspx?GROUP=BICO-HS6.

[2] The "Other Agri-Products" category includes a wide range of commodities; animal fats, food preparations, alcohol, confectionery (chewing gum & candy, chocolate & cocoa products), coarse grains (excluding corn), coffee (roasted, extracts, and unroasted), condiments & sauces, distillers grains, pet food, eggs & products, essential oils, fresh and processed fruits and vegetables, fruit & vegetable juices, hay, hides & skins, industrial alcohols & fatty acids, live animals, meat products (NESOI), manufactured tobacco, milled grains & products, nursery products & cut flowers, oilseed meal/cake (excluding soybean), oilseeds (NESOI), other bulk commodities, feeds & fodders, intermediate products, palm oil, peanuts, planting seeds, poultry meat & products (excluding eggs), pulses, rapeseed, rice, soybean oil, spices, sugars & sweeteners, tea, tobacco, and vegetable oils (NESOI).

every estimate, considering a 90% confidence interval.[3] Using the estimated coefficients and data on tariff increases for U.S. agricultural exports, we first estimate the trade elasticity for each percentage increase in tariffs during the 2018 trade war. Since tariffs are imposed at a more granular level (HS-10), we aggregate the total tariff increase for each commodity under the relevant HS-BICO 6 groups, where the coefficients were estimated. By averaging these increases, we then calculate the trade elasticity for each percentage tariff increase, specific to each trading partner.[4]

- Import share: Lastly, we account for each retaliating country's import share for each U.S. commodity using U.S. Census Bureau data through USDA FAS (2025).

In Scenario 1, Canada retaliates with a 25% tariff on U.S. agricultural goods. Ethanol exports from the U.S. could decline by up to 24.8%, equivalent to $1.2 billion in losses. Soybean meal could also be affected, with an estimated export loss of 7.8%, or $0.45 billion. Other products like animal fats and food preparations may experience up to 15.3% losses. The industries most at risk include rapeseed (59% decline), palm oil (46% decline), nursery products (35% decline), and pet food (34% decline), all of which could be severely impacted if Canada retaliates.

In Scenario 2, Mexico's retaliation could substantially affect U.S. grain exports. Corn might face an 18.4% export loss, equating to a $2 billion shortfall, while wheat could see a 14.7% export decline, or $0.87 billion. Soybean meal and dairy products are also vulnerable, with projected losses of 11.6% and 10.5%, respectively. Other agricultural commodities, such as sugar and sweeteners (36% decline), peanuts (33% decline), and animal fats (32% decline), are likely to bear the brunt of the impact, driven by Mexico's market share.

In Scenario 3, we estimate a decline in U.S. soybean exports, reflecting both the importance of soybeans as one of the U.S.'s highest-value agricultural exports and China’s dominant market share. The export loss could reach 16.3%, amounting to $3.4 billion. Corn and cotton are also expected to experience notable declines, with losses of 4.9% and 4.2%, respectively. Additionally, within the "other agricultural products" category, commodities such as coarse grains (31%), peanuts (12%), and hides and skins (12%) could face considerable losses due to China’s market share.

If all countries retaliate against the U.S. agricultural food sector, as in Scenario 4, total U.S. agricultural exports could face a $36.3 billion export loss, which would represent one-fifth of total projected U.S. agricultural exports. The largest contributors to this loss would be ethanol (29.1%), corn (26.1%), soybean (23.9%), soybean meal (19.4%), and dairy products (16.3%). Meanwhile, the most severely impacted markets would include peanuts (77% decrease), rapeseed (64%), palm oil (58%), sugars and sweeteners (50%), nursery products (48%), pet food (41%), and snacks (40%).

Figure 1 presents total projected export losses by state (Panel a) and the export losses for the 10 most exported U.S. agricultural commodities (Panels b to k) under Scenario 4 for each state. To allocate these losses, we distribute the projected loss for each commodity based on each state's average export share from 2020 to 2022, using data from the USDA ERS State Agricultural Trade Data (2025).

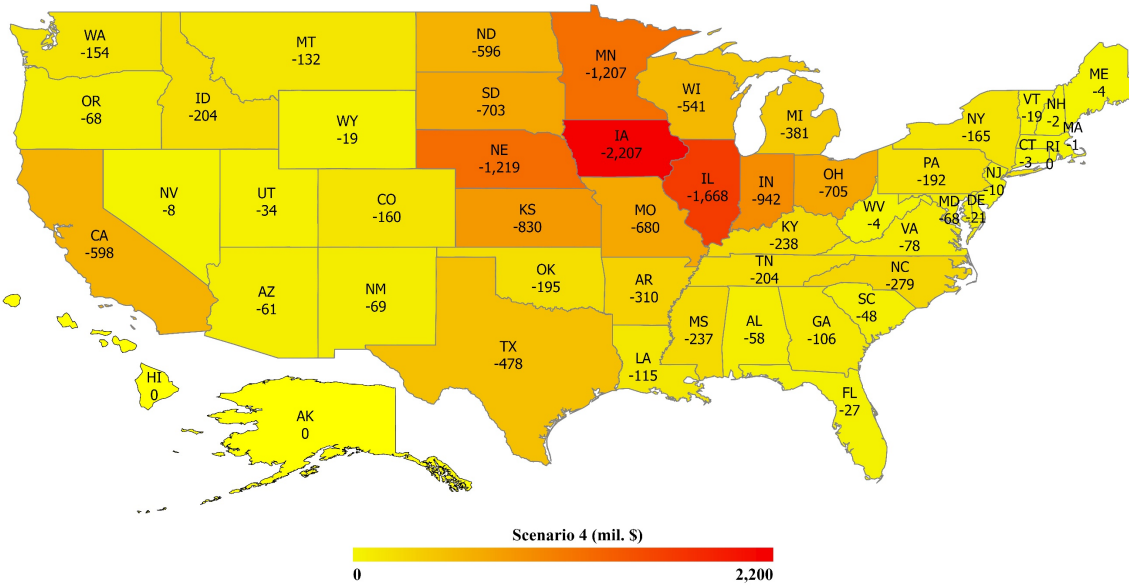
[3] A confidence interval (CI) assumes that 90% of the samples drawn from a population will fall within the calculated lower and upper bounds. The formula for the bounds of a 90% CI is given by $CI = \bar{x} \pm \left(1.645 \times \frac{s}{\sqrt{n}}\right)$, where $\bar{x}$ is the sample mean, s is the sample standard deviation, and n is the number of observations in the sample. The value 1.645 is the Z-score corresponding to the 90% confidence level in the standard normal distribution (N(0,1)).

[4] We weight these tariff increases by the import share of retaliating countries for each commodity under BICO-HS6 classification, using historical bilateral trade data from the BACI (2024) dataset.

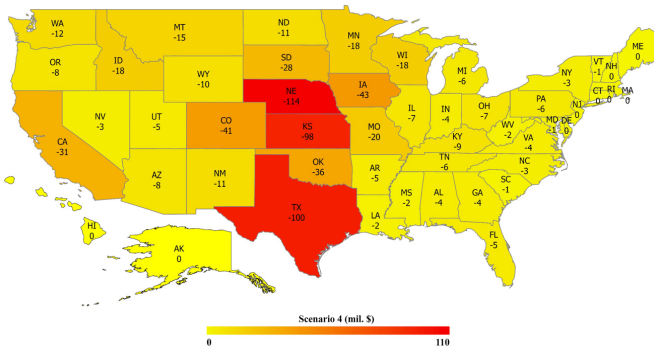
Table 2. Potential Changes in U.S. Agricultural Exports with Retaliatory Tariffs

Commodity (BICO-HS6)	Baseline Projection 2025 (billion $)	Scenario 1 (Δ%)			Scenario 2 (Δ%)			Scenario 3 (Δ%)			Scenario 4 (Δ%)		
		Lower Bound	Point Estimate	Upper Bound	Lower Bound	Point Estimate	Upper Bound	Lower Bound	Point Estimate	Upper Bound	Lower Bound	Point Estimate	Upper Bound
Soybeans	$20.8	-0.32	-0.5	-0.5	-5.1	-7.2	-8.3	-11.5	-16.3	-18.8	-16.8	-23.9	-27.6
Corn	$11.1	-0.9	-2.8	-3.8	-6.1	-18.4	-24.5	-1.6	-4.9	-6.5	-8.6	-26.1	-34.8
Dairy products	$9.5	-3.4	-4.4	-5.3	-8.0	-10.5	-12.6	-1.1	-1.4	-1.7	-12.5	-16.3	-19.6
Beef & beef prod.	$9.2	-1.7	-2.9	-3.8	-1.9	-3.2	-4.4	-1.1	-1.8	-2.5	-4.6	-7.9	-10.7
Pork & pork prod.	$9.2	-2.9	-3.2	-3.5	-5.7	-6.4	-7.0	-1.9	-2.2	-2.4	-10.5	-11.8	-12.8
Tree nuts	$9.0	-0.5	-1.6	-2.3	-0.2	-0.7	-1.0	-0.2	-0.7	-1.1	-1.0	-3.0	-4.5
Cotton	$6.4	0.0	0.0	0.0	-1.0	-1.9	-2.6	-2.2	-4.2	-5.7	-3.3	-6.1	-8.3
Wheat	$5.9	-0.3	-0.4	-0.4	-11.3	-14.7	-16.0	-2.1	-2.7	-2.9	-13.7	-17.9	-19.4
Soybean meal	$5.8	-2.2	-7.8	-8.9	-3.3	-11.6	-13.2	0.0	0.0	0.0	-5.6	-19.4	-22.1
Ethanol	$4.8	-20.6	-24.8	-26.0	-3.2	-3.8	-4.0	-0.4	-0.5	-0.6	-24.2	-29.1	-30.5
Other agri.-prod.	$81.9	-12.8	-15.3	-17.4	-6.7	-8.0	-9.1	-1.9	-2.1	-2.4	-21.3	-25.4	-28.9
Total changes (in %)	$173.7	**-7.2**	**-9.0**	**-10.3**	**-5.6**	**-8.0**	**-9.4**	**-2.8**	**-3.9**	**-4.5**	**-15.6**	**-20.9**	**-24.3**
Total changes (billion $)	$173.7	**-12.6**	**-15.7**	**-18.0**	**-9.8**	**-13.9**	**-16.3**	**-4.8**	**-6.7**	**-7.8**	**-27.1**	**-36.3**	**-42.1**

Note. This table presents estimated export losses for the year 2025. We represent U.S. export losses to global markets as a percentage of projected export value. Δ% refers to percentage change. Upper and lower bounds for each scenario correspond to a 90% confidence interval. The last two rows present the total potential loss in U.S. agricultural exports in percentages and billions of dollars.



(a) Total



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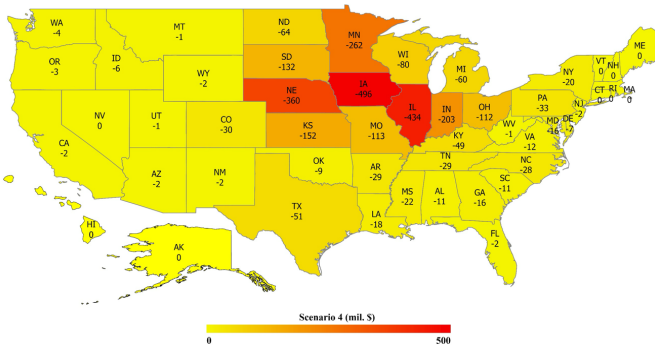
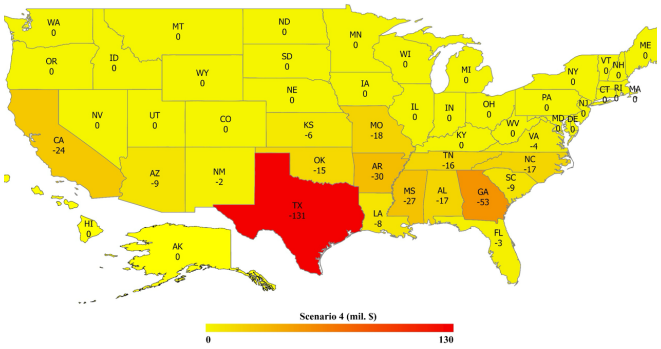
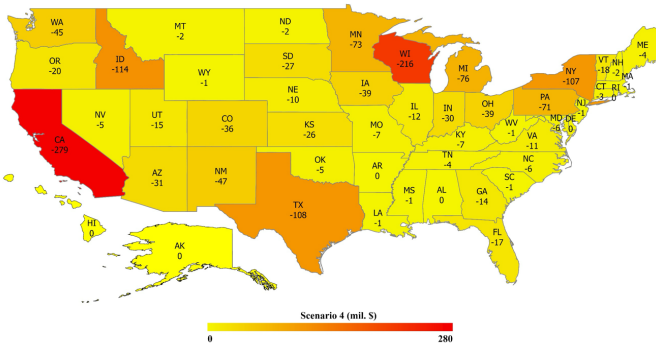


(c) Corn



(d) Cotton



(e) Dairy

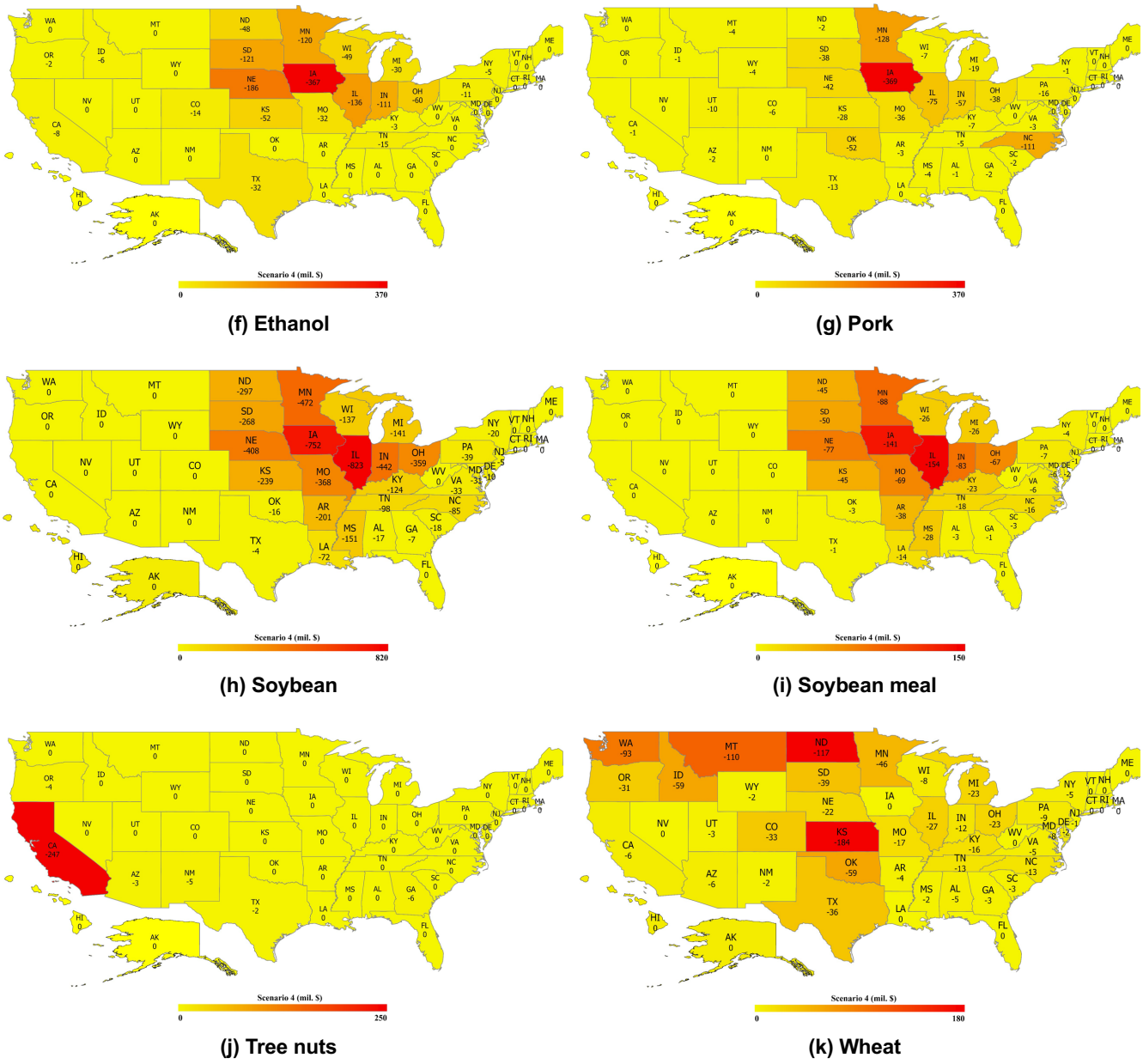


Figure 1. Projected Export Losses by State

Overall, the states projected to experience the largest export losses across all commodities are Iowa, Illinois, Minnesota, and Nebraska, with estimated declines ranging from $2.2 billion to $1.2 billion. These potential losses are primarily driven by soybean and corn, while these states are also expected to see the highest relative declines in soybean meal, pork, and ethanol exports. On the other hand, California is expected to be the most affected in dairy and tree nuts, while Texas is projected to see the largest losses in beef and cotton. In the wheat industry, Kansas and North Dakota are projected to face the greatest export declines.

Potential Risks to North Dakota Agriculture

North Dakota is projected to face an export loss of $0.6 billion under scenario 4, ranking 11th among all U.S. states. Soybean and wheat exports account for 70% of this potential decline. Given the significance of these commodities to North Dakota's agricultural economy, we estimate the potential impacts on exports, farm prices, production, and farm revenue under each scenario.

Table 3 presents potential export losses for North Dakota soybeans and wheat. To estimate North Dakota export changes, we account for Canada, Mexico, and China's share of North Dakota soybean and wheat exports. For North Dakota wheat, we use the Upper Great Plains Transportation Institute's 2010 report (Vachal et al. 2010), which details North Dakota wheat and durum exports by destination country and transportation route from 2005 to 2009. We determine each destination's share by averaging exports over those years for each route and dividing by the total average exports for that route. These shares are then updated using the Institute's 2023 Agriculture Shipment Brief Reports for wheat and durum wheat.

Table 3. Potential Trade Changes for North Dakota

		Soybeans			Wheat		
	Baseline Projections	**$967 mil.**			**$1,022 mil.**		
		Lower Bound	Point Estimate	Upper Bound	Lower Bound	Point Estimate	Upper Bound
Scenario 1	mil. $	-0.43	-0.61	-0.71	-39.90	-52.13	-56.64
	%	-0.04%	-0.06%	-0.07%	-3.90%	-5.10%	-5.54%
Scenario 2	mil. $	-34.36	-48.87	-56.25	-48.16	-62.92	-68.36
	%	-3.56%	-5.06%	-5.82%	-4.71%	-6.16%	-6.69%
Scenario 3	mil. $	-174.07	-247.56	-284.94	-1.65	-2.16	-2.34
	%	-18.01%	-25.61%	-29.48%	-0.16%	-0.21%	-0.23%
Scenario 4	mil. $	-208.86	-297.04	-341.89	-89.71	-117.20	-127.35
	%	-21.61%	-30.73%	-35.37%	-8.78%	-11.47%	-12.46%

For North Dakota soybeans, we use two sources to determine each country's share in North Dakota's total soybean exports. First, data from the Surface Transportation Board (STB, 2024) shows that most of North Dakota's soybeans are transported by rail to U.S. ports in the Pacific Northwest, particularly in Oregon and Washington. About 94.6% of exports from these ports are shipped to China, with the rest going to the Philippines, Taiwan, Japan, and Vietnam (U.S. Census Bureau, 2025). Second, we use the USDA ERS's State Trade by Country of Origin and Destination dataset (2025), which tracks trade from the point of assembly or the destination where products are disassembled after shipment. This dataset helps us identify the share of soybean exports from North Dakota to Canada and Mexico. We estimate each country's share of North Dakota's soybean exports by integrating both data sources.

The largest impact on North Dakota soybean exports could arise from Scenario 3, in which China retaliates against U.S. soybeans. As noted, 96.4% of U.S. soybean exports to China are shipped through the Pacific Northwest, with North Dakota contributing approximately two-thirds of its production to this route. Under Scenario 3, North Dakota's soybean exports to global markets could decline by

25.6%, amounting to a $248 million loss, while Mexico's retaliation could result in a 5.1% decline. For wheat, losses would primarily come from tariffs imposed by NAFTA members. A 25% tariff on U.S. soybeans could reduce North Dakota's soybean exports to Canada by 5.1% and to Mexico by 6.2%, leading to losses of $52 million and $63 million, respectively. If all three countries impose retaliatory tariffs on U.S. soybeans, North Dakota's agricultural export value could decline by 70%, translating into a $414 million loss for 2025.

Table 4 presents our export loss estimates at the county level for each scenario. Using production data from USDA NASS (2025), we calculate the average soybean and wheat production for each county from 2020 to 2022. Each county's share is then applied to North Dakota's total projected export losses to assess the potential risk across all counties. **Figure 2** visualizes these losses under Scenario 4, highlighting the most affected areas for both crops. For soybeans, the southeastern region is expected to bear the greatest losses, with Cass, Richland, Stutsman, and Barnes counties facing declines of $26 million, $19 million, $18.5 million, and $16 million, respectively. The counties most affected by wheat include Ward, Bottineau, Pembina, McLean, Williams, and Walsh, with losses ranging from $6.2 million to $4 million.

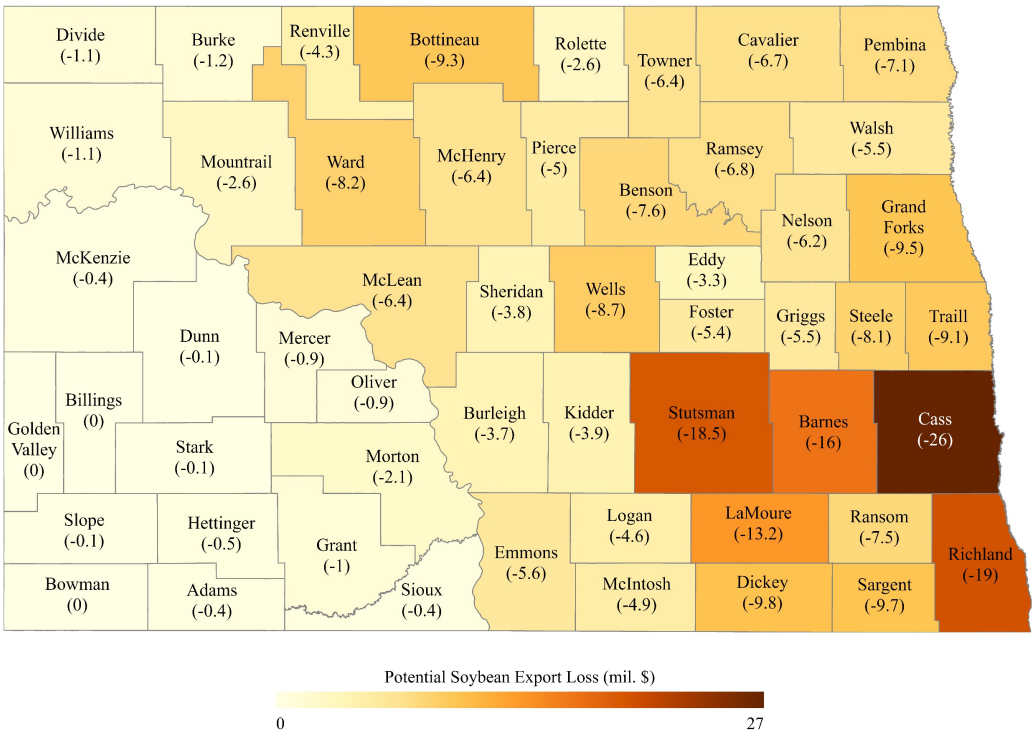
Table 4. Projected Export Losses by County (million $)

County	Soybean				Wheat			
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Cass	-0.1	-4.3	-21.6	-26.0	-0.9	-1.1	0.0	-2.1
Richland	0.0	-3.1	-15.8	-19.0	-0.5	-0.6	0.0	-1.1
Stutsman	0.0	-3.0	-15.4	-18.5	-0.6	-0.7	0.0	-1.3
Barnes	0.0	-2.6	-13.3	-16.0	-0.6	-0.8	0.0	-1.5
LaMoure	0.0	-2.2	-11.0	-13.2	-0.2	-0.2	0.0	-0.5
Dickey	0.0	-1.6	-8.2	-9.8	0.0	0.0	0.0	-0.1
Sargent	0.0	-1.6	-8.0	-9.7	-0.1	-0.1	0.0	-0.2
Grand Forks	0.0	-1.6	-7.9	-9.5	-1.3	-1.6	-0.1	-3.0
Bottineau	0.0	-1.5	-7.7	-9.3	-2.4	-2.9	-0.1	-5.4
Traill	0.0	-1.5	-7.6	-9.1	-0.7	-0.9	0.0	-1.7
Wells	0.0	-1.4	-7.3	-8.7	-1.1	-1.3	0.0	-2.5
Ward	0.0	-1.4	-6.9	-8.2	-2.7	-3.3	-0.1	-6.2
Steele	0.0	-1.3	-6.8	-8.1	-0.4	-0.5	0.0	-1.0
Benson	0.0	-1.2	-6.3	-7.6	-1.4	-1.7	-0.1	-3.1
Ransom	0.0	-1.2	-6.3	-7.5	-0.2	-0.3	0.0	-0.5
Pembina	0.0	-1.2	-5.9	-7.1	-2.1	-2.6	-0.1	-4.8
Ramsey	0.0	-1.1	-5.6	-6.8	-1.4	-1.6	-0.1	-3.0
Cavalier	0.0	-1.1	-5.6	-6.7	-1.1	-1.4	0.0	-2.5
McLean	0.0	-1.1	-5.4	-6.4	-2.1	-2.5	-0.1	-4.7
McHenry	0.0	-1.1	-5.3	-6.4	-0.5	-0.6	0.0	-1.2
Towner	0.0	-1.0	-5.3	-6.4	-1.6	-2.0	-0.1	-3.7

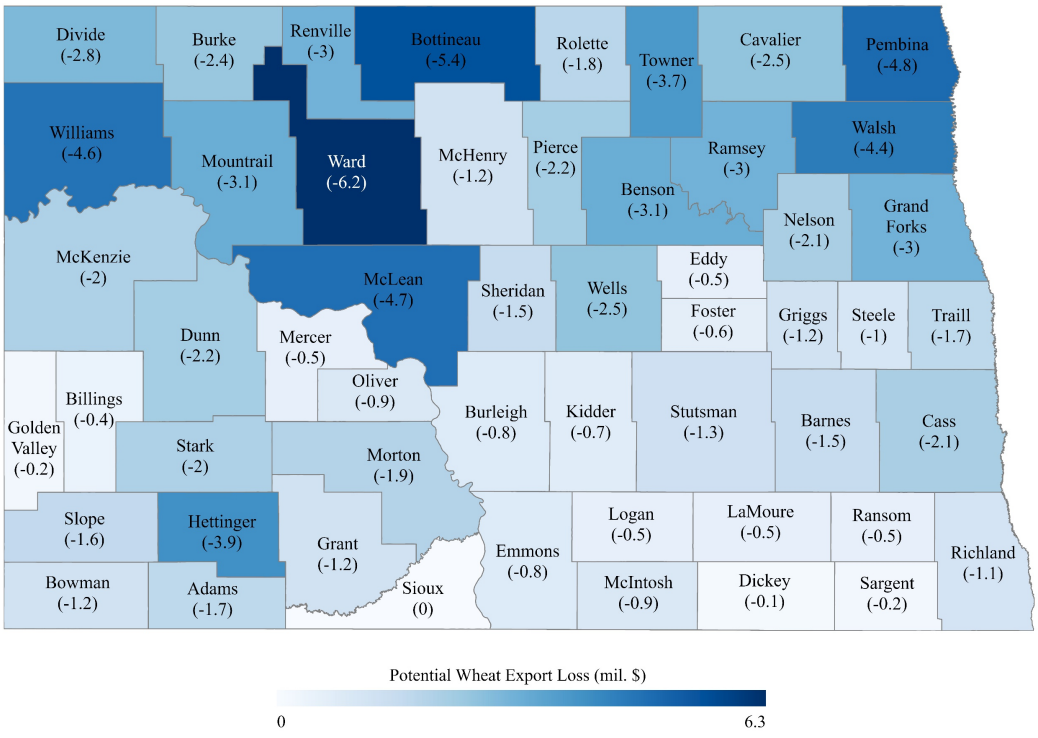
Continued on next page.

County	Soybeans				Wheat			
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Nelson	0.0	-1.0	-5.1	-6.2	-0.9	-1.1	0.0	-2.1
Emmons	0.0	-0.9	-4.7	-5.6	-0.4	-0.5	0.0	-0.8
Griggs	0.0	-0.9	-4.6	-5.5	-0.5	-0.6	0.0	-1.2
Walsh	0.0	-0.9	-4.6	-5.5	-2.0	-2.4	-0.1	-4.4
Foster	0.0	-0.9	-4.5	-5.4	-0.3	-0.3	0.0	-0.6
Pierce	0.0	-0.8	-4.2	-5.0	-1.0	-1.2	0.0	-2.2
McIntosh	0.0	-0.8	-4.1	-4.9	-0.4	-0.5	0.0	-0.9
Logan	0.0	-0.8	-3.9	-4.6	-0.2	-0.3	0.0	-0.5
Renville	0.0	-0.7	-3.6	-4.3	-1.4	-1.6	-0.1	-3.0
Kidder	0.0	-0.6	-3.3	-3.9	-0.3	-0.4	0.0	-0.7
Sheridan	0.0	-0.6	-3.2	-3.8	-0.7	-0.8	0.0	-1.5
Burleigh	0.0	-0.6	-3.1	-3.7	-0.4	-0.4	0.0	-0.8
Eddy	0.0	-0.6	-2.8	-3.3	-0.2	-0.3	0.0	-0.5
Rolette	0.0	-0.4	-2.2	-2.6	-0.8	-1.0	0.0	-1.8
Mountrail	0.0	-0.4	-2.2	-2.6	-1.4	-1.7	-0.1	-3.1
Morton	0.0	-0.3	-1.7	-2.1	-0.9	-1.0	0.0	-1.9
Burke	0.0	-0.2	-1.0	-1.2	-1.1	-1.3	0.0	-2.4
Divide	0.0	-0.2	-0.9	-1.1	-1.2	-1.5	-0.1	-2.8
Williams	0.0	-0.2	-0.9	-1.1	-2.1	-2.5	-0.1	-4.6
Grant	0.0	-0.2	-0.8	-1.0	-0.5	-0.6	0.0	-1.2
Mercer	0.0	-0.1	-0.7	-0.9	-0.2	-0.3	0.0	-0.5
Oliver	0.0	-0.1	-0.7	-0.9	-0.4	-0.5	0.0	-0.9
Hettinger	0.0	-0.1	-0.4	-0.5	-1.7	-2.1	-0.1	-3.9
McKenzie	0.0	-0.1	-0.3	-0.4	-0.9	-1.0	0.0	-2.0
Adams	0.0	-0.1	-0.3	-0.4	-0.8	-0.9	0.0	-1.7
Sioux	0.0	-0.1	-0.3	-0.4	0.0	0.0	0.0	0.0
Stark	0.0	0.0	-0.1	-0.1	-0.9	-1.1	0.0	-2.0
Dunn	0.0	0.0	-0.1	-0.1	-1.0	-1.2	0.0	-2.2
Slope	0.0	0.0	-0.1	-0.1	-0.7	-0.8	0.0	-1.6
Billings	0.0	0.0	0.0	0.0	-0.2	-0.2	0.0	-0.4
Bowman	0.0	0.0	0.0	0.0	-0.6	-0.7	0.0	-1.2
Golden Valley	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	-0.2

Note. We did not redistribute the “combined county” production across other counties; instead, we used the raw data provided by USDA NASS (2025).



(a) Soybeans



(b) Wheat

Figure 2. Projected Export Losses by County

Considering the negative impacts on North Dakota soybean exports, we further analyze the potential losses in farm price, production, and farm revenue for the soybean industry.

- Farm price effect: Our farm price predictions reflect the anticipated decline in North Dakota domestic soybean market prices for each scenario for the year 2025. To project North Dakota's soybean prices, we indexed national price projections from the USDA's World Agricultural Outlook Board report (2025) to the state level using historical state price data from the USDA NASS (2025). After estimating the historical price difference between state and national levels, we applied this adjustment to the projected national prices. The soybean price elasticity estimates, derived from historical trade data between the U.S. and China, are sourced from Adjemian et al. (2021). Using this estimate, we calculate the price elasticity for Canada and Mexico by considering the soybean export shares of the U.S. and North Dakota to these countries, based on supply and demand dynamics and USDA historical data from 2020 to 2023. The lower and upper bounds are determined using the 90% confidence interval of the estimated standard errors from Adjemian et al. (2021). Lastly, we assume that any decrease in farm prices would be fully reflected in potential reductions in Gulf prices following retaliatory tariffs.
- Production effect: Our state-level soybean production estimates show the anticipated reduction in North Dakota's domestic soybean output across various scenarios for 2025. To project soybean production for North Dakota in 2025, we indexed the national projections from the USDA report to the state level, considering the upward trend in North Dakota's production. National-level soybean production figures are derived from the USDA's 2024 report, with market year projections adjusted to fit the calendar year. Historical state-level production data is sourced from USDA NASS (2025). Elasticities are estimated using historical production data at both state and national levels from 2018 and 2019 and then adjusted based on the export shares to destination countries. The lower and upper bounds are determined using the 90% confidence interval of the standard deviation of historical data from 2001 to 2018.
- Farm revenue: Our farm revenue estimates for soybeans indicate the potential decline in North Dakota farmers' revenues resulting from decreases in price and production as the soybean market deteriorates under the scenarios. We estimate farm revenue using two different methods. The first method, based on Kim et al. (2024), calculates farm revenue for North Dakota using projected national production and farm price values from the USDA report (2024). To estimate North Dakota soybean farm revenue under each scenario, they multiply the national calculated farm revenue by the 2015-2022 average share of North Dakota's cash receipts in the national total. The second method utilizes estimates from Westhoff et al. (2019), enabling us to calculate tariff revenue elasticity, focusing solely on price adjustments. The first calculation from Kim et al. (2024) accounts for price adjustments and production quantities.

Table 5 presents the estimated effects on farm price, production, and revenue for North Dakota soybeans under each scenario. In line with China's significance as a buyer, Scenario 3 would have the largest impact, potentially lowering farm prices by $0.30. In contrast, retaliation from Canada would have a negligible effect on soybean farm prices, while Mexico's retaliation could decrease up to $0.13. This reduction in farm price would likely translate into decreased soybean production, with an estimated decline of nearly 6% across the state if Scenario 3 occurs, leading to a revenue loss of $182 million based on the estimation method developed by Kim et al. (2024). Conversely, the impact on soybean farm revenue from Scenario 1 is projected to be limited to a decline of $5 million, while Scenario 2

could result in a loss of $81 million. If all scenarios were to materialize, as represented in Scenario 4, farm revenue could decline by 13%, equating to a total loss of $264 million.

Figure 3 maps the estimated $264 million farm revenue losses at the county level. We assessed the losses by allocating them to each county based on their average share of soybean production from 2020 to 2022. The southeastern counties of North Dakota would bear the brunt of this total loss, accounting for 40% of the overall decline. Cass County is projected to experience the highest farm revenue loss, with an estimated reduction of $23.1 million.

Table 5. Potential Impact on North Dakota Soybean Prices, Production, and Farm Revenues

	Farm price effect			Production effect			Farm revenue effect	
	$10.25 per bushel			214 mil. bushels			$10.75 per bushel	
Scenarios	Lower Bound	Point Estimate	Upper Bound	Lower Bound	Point Estimate	Upper Bound	Westhoff et al. (2019)	Kim et al. (2024)
Scenario 1	-0.01	-0.01	-0.01	-0.22	-0.35	-0.49	-2.39	-5.16
	-0.07%	-0.09%	-0.10%	-0.10%	-0.17%	-0.23%	-0.10%	-0.25%
Scenario 2	-0.11	-0.13	-0.16	-3.50	-5.63	-7.76	-37.99	-81.09
	-1.13%	-1.39%	-1.66%	-1.64%	-2.63%	-3.62%	-1.65%	-3.99%
Scenario 3	-0.24	-0.30	-0.36	-7.94	-12.76	-17.58	-86.11	-181.68
	-2.57%	-3.16%	-3.75%	-3.71%	-5.96%	-8.21%	-3.75%	-8.93%
Scenario 4	-0.36	-0.44	-0.52	-11.66	-18.74	-25.83	-126.50	-264.24
	-3.77%	-4.64%	-5.51%	-5.45%	-8.75%	-12.06%	-5.51%	-12.99%

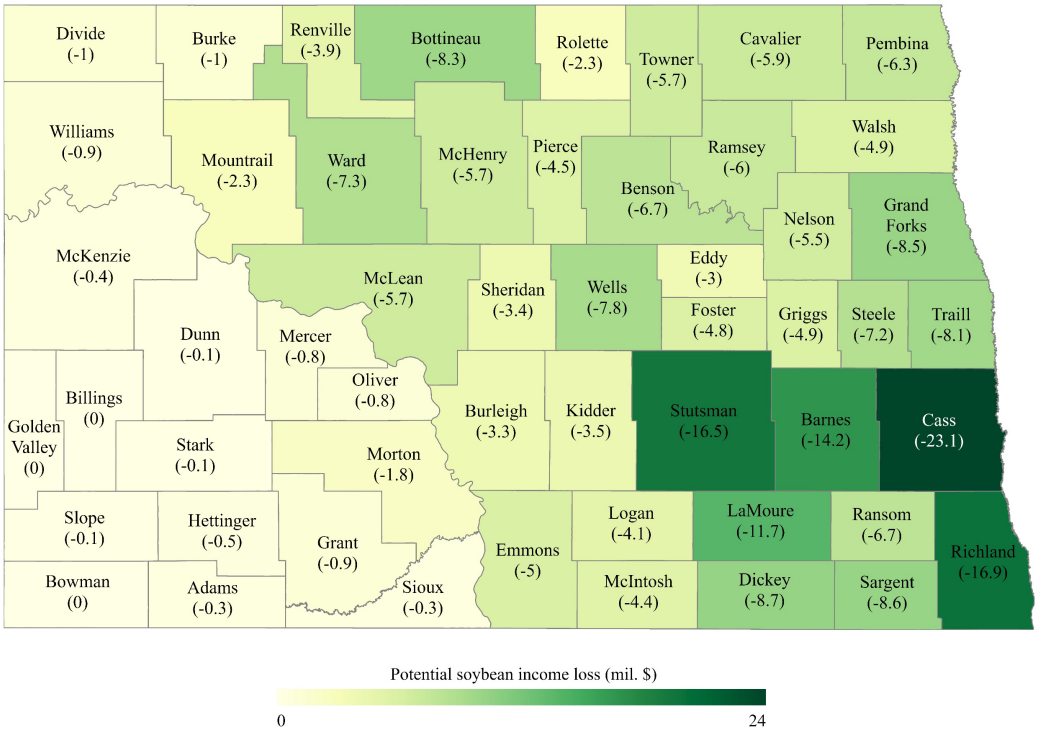


Figure 3. Projected Soybean Income Losses by County

Additional Considerations

Several factors may impact the outcomes of our analysis beyond the assumptions made in our model. First, fluctuations in exchange rates, particularly a stronger U.S. dollar following the imposition of import tariffs, could enhance the global competitiveness of commodities from other countries in the short run, further impacting the position of U.S. commodities in international markets. For instance, Brazil's trade competitiveness may improve in the first year, leading to a greater decline in U.S. export losses. However, price and currency realignments could also moderate these effects in the long run. For instance, while a stronger US$ initially reduces U.S. competitiveness, market adjustments could lead to a weaker dollar over time, improving affordability for foreign buyers. Lower domestic soybean prices in response to weaker export demand could make U.S. soybeans more attractive to global markets, partially offsetting losses. Lastly, while our analysis draws on historical retaliatory actions during the 2018-2019 trade war, it is essential to acknowledge that future dynamics may differ, and there is no certainty that Canada, Mexico, and China will specifically target U.S. agricultural products.

Disclaimer

This report is intended to inform discussions on trade policy shifts and their potential impact on U.S. agriculture. While it may be shared and referenced, the authors assume full responsibility for errors or omissions. The findings and conclusions presented are based on available data and economic modeling and do not necessarily reflect the views of any institution or organization. Readers are encouraged to use this analysis as a reference while considering additional sources and expert insights for policy and business decisions.

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