Market-Driven Inventory System (MDIS)

Over the last dozen years, low-price and high-price extremes revealed shortcomings of the U.S. agricultural commodity program. Under the current program when supply exceeds demand, crop prices drop precipitously, resulting in very high farm program expenditures. Livestock producers and other grain demanders become the real beneficiaries, while farmers in other countries accuse us of dumping. At the other extreme, when demand outruns supply, prices spike and crop net returns often vastly exceed total production costs. The pendulum shift in feed prices causes hardship in the livestock, dairy and biofuels industries and raises consumer prices for food staples, disproportionately affecting the most vulnerable worldwide. These experiences demonstrate that the current commodity program cannot significantly mitigate damaging price and market-receipt variability.

The Market-Driven Inventory System (MDIS) is an agricultural commodity program that reduces price volatility, reduces government expenses, increases the value of crop exports, and maintains net farm income over time. The central feature of MDIS is a voluntary, farmer-owned and market-driven inventory system that operates under market forces during normal conditions but moderates prices at the extremes. Inventory stocks activity would only be activated when crop prices become so low or so high that normally profitable agricultural firms are not provided with reasonable investment and production signals. By working with the market, MDIS would ensure that farmers receive their income from the market instead of from government payments.

A two-phase study by the University of Tennessee's Agricultural Policy Analysis Center found that MDIS can provide the functions sought by NFU members. The first portion of the study (Phase I) is a rerun of history from 1998 to 2010 with one change: the commodity programs during that period are replaced with MDIS. The second (Phase II) uses the USDA Ten-Year Baseline released in February 2012 as the starting point for the analysis. Because ten-year-ahead baseline projections lack real world variability, a pattern of shocks that roughly mimic the variability experienced by crop agriculture in from 1998 to 2010 were imposed on the projections.

The POLYSYS simulation model is the analytical model used in this analysis. POLYSYS simulates changes in policy instrument levels and/or economic situations as variation away from a baseline situation. In this analysis, historical data become the baseline for Phase I and the USDA baseline was used for Phase II. Crop allocation decisions are made with linear programming models using county-level data as a proxy for farm-level decisions. The crop prices and demands as well as all livestock variables are estimated at the national level. National estimates of revenues, costs and net returns are also estimated.

Market-Driven Inventory System (MDIS)

Phase I Background

In this portion of the analysis, the actual historical supply, demand, and price numbers are compared with what those numbers are estimated to have been had MDIS been in effect. With MDIS in operation, markets work uninterrupted until prices are estimated to fall below a recourse loan rate or, if MDIS inventory is available, prices exceed 160 percent of the loan rate.

In the former case, the model estimates the amount of grain that farmers would need to put under recourse loan with the Farm Service Agency to raise the market price to or above the loan rate, which is the "price" that FSA uses to value the grain used as collateral for the loan. If a market price is estimated to exceed 160 percent of the loan rate, the model checks to see if there is an inventory stock in the MDIS farmer-owned inventory. If MDIS inventory is available, the model computes the quantity needed to lower price to about 160 percent of the loan rate and allows that amount of stock onto the market.

For the historical analysis, the beginning corn loan rate is computed as halfway between the variable cost of producing a bushel of corn and the corresponding total production cost. In 1998 that number is computed to be $2.27 per bushel of corn. The 1998 loan rates for other crops are computed to be in the same proportion to corn loan rates as those legislated in the 1996 farm bill, except for grain sorghum for which the loan rate is raised to be equal to that of corn and for soybeans for which the loan rate is raised to $6.32. The loan rates of all crops are adjusted for 1999 through 2010 using the prices paid by farmers chemical input index. The maximum quantities of grain allowed in the MDIS inventory are specified (3 billion bushels of corn, 800 million bushel of wheat, 400 million bushels of soybeans). Farmers with MDIS recourse loans are paid 40 cents/bushel/year to store the grain and are required to keep the grain in condition.

The grain under MDIS must stay in inventory, that is, cannot be redeemed by paying off the loan and marketed until the price goes above the release price of 160 percent of the loan rate and notification is specifically received. With MDIS in effect, all government payment programs, except MDIS inventory storage payments, are eliminated for corn, grain sorghum, oats, barley, wheat, and soybeans. An optional set-aside would be available for use at the secretary's discretion if MDIS inventory maximums are reached and prices fell below loan rates. Rice and cotton are not included in MDIS and are assured to remain eligible for current program payments.

Market-Driven Inventory System (MDIS)

Phase I Key Findings

- During 1998 to 2010 actual crop government payments totaled $152 billion; had MDIS been in effect the estimate is $56 billion, a savings of nearly two-thirds.

- Crop prices were significantly higher under MDIS in the early part of the period and for the full 1998 to 2010 period prices were higher by a quarter, half dollar, and dollar per bushel for corn, wheat and soybeans respectively compared to actual prices.

- Had MDIS or a similar inventory-based commodity program been in effect from 1998 to 2010 the value of crop exports would have exceeded the actual value of exports during that period. A higher crop price does cause a reduction in the quantity exported but that decline is less than the increase in price. As a result, the value of exports increases with price increases and decreases with price declines. (This property does not bode well for the future direction of the change in value of agricultural exports over the next few years if prices decline.)

- With MDIS in effect, annual net farm income was, on average, higher in the early part of the period (1998-2005) and lower in the latter part of the period (2006-2010) but for the full 13 years the MDIS net farm income averaged only slightly lower ($51.1 billion vs. $52.1 billion)

Phase II Background

The analysis for this portion of the study follows the approach and most of the basic specifications used for Phase I. The loan rates for this analysis (all in $/bu) are: $3.50 for corn, grain sorghum and barley, $2.49 for oats, $5.28 for wheat and $8.97 for soybeans. The loan rates have the same proportion to corn as the loan rates in the 2008 farm legislation. Loan rates are held constant for the full 2012 to 2020 period. The MDIS inventory maximums, storage payment rate and release percentage of loan rates are the same as in historical analysis. The 2012 USDA baseline is the beginning point for the analysis but production shocks were used to mimic the variability that crop and livestock agricultures experienced between 1998 and 2010. The resulting comparisons below are between this shocked baseline assuming continuation of current commodity programs and the MDIS alternative. The MDIS simulation includes the same production shocks.

Phase II Findings

- Government payments with a continuation of the current program and shocked production total $65 billion over the ten years from 2012 to 2021; with MDIS the estimate is $26 billion, a 60 percent reduction.
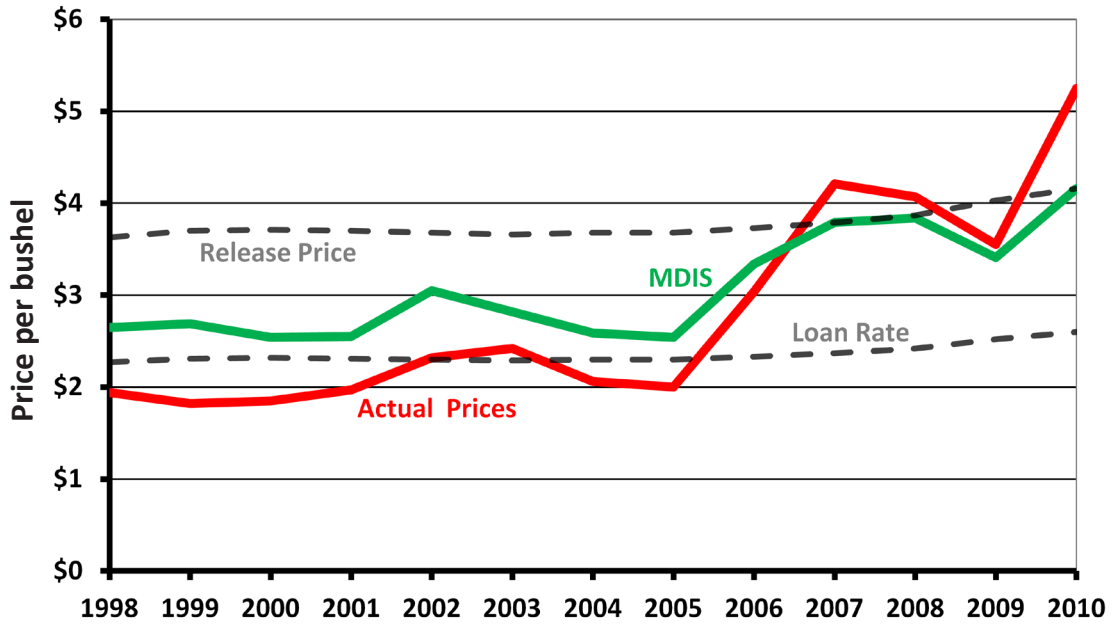
- Net farm incomes averaged over the ten years are almost identical ($79.2 billion per year under the current program and slightly higher with MDIS at $79.6 billion).

- Because crop prices average higher with MDIS than under the current program, the value of exports over the ten year period is higher with MDIS by $15 billion or $1.5 billion per year on average (more in the first part of the period; less in the latter part of the period).

Conclusions and Policy Implications

- MDIS reduces crop price extremes that otherwise cause severe economic dislocations in the crop and livestock sectors and cause exaggerated market signals that lead to inefficient resource allocations in the short-run and non-optimal investments in the longer-run.

- MDIS could save tens of billions of dollars paid under existing government payment programs and additional tens of billions in "emergency" payments and government subsidies to revenue insurance programs otherwise needed to offset the almost inevitable periodic severe collapses in grain prices. Under MDIS, grain farmers receive their income from the market and grain demanders are not subsidized or overcharged.

- MDIS helps stabilize grain prices internationally to the benefit of those producers and consumers for which grains are a staple food.

- MDIS provides trade benefits to crop farmers by helping ensure that exportable grain quantities are available in the farmer-owned inventory system when worldwide supplies are short and thus help preserve the U.S. reputation as a dependable supplier in world markets.

- MDIS discourages or derails "dumping" accusations by competing grain exporters. The value of U.S. grain exports increases and agriculture's trade balance improves because MDIS raises crop prices when crop supplies exceed utilization which also increases the value of grain exports.
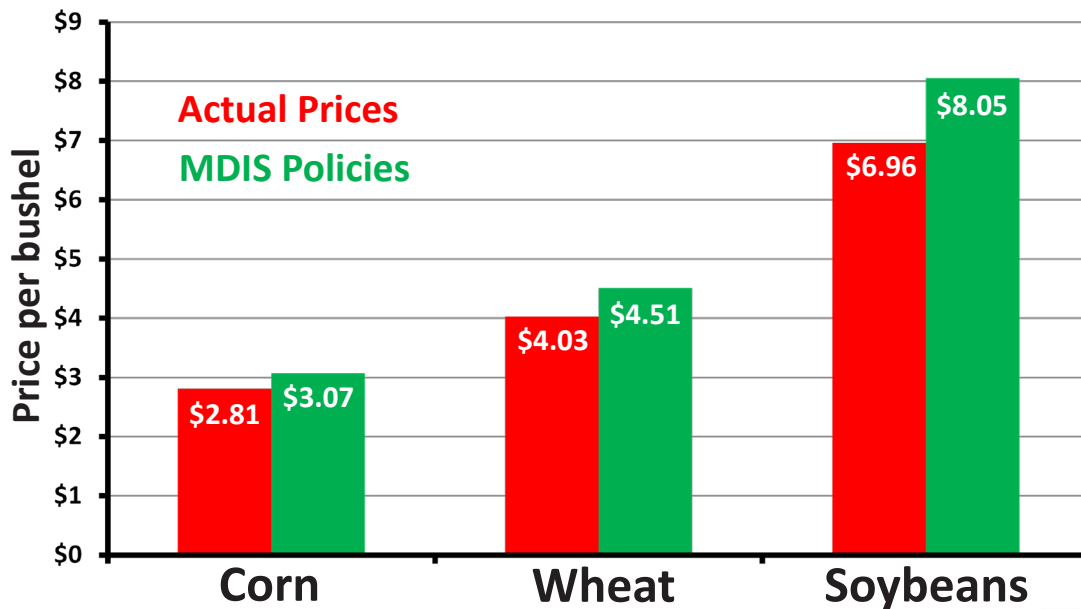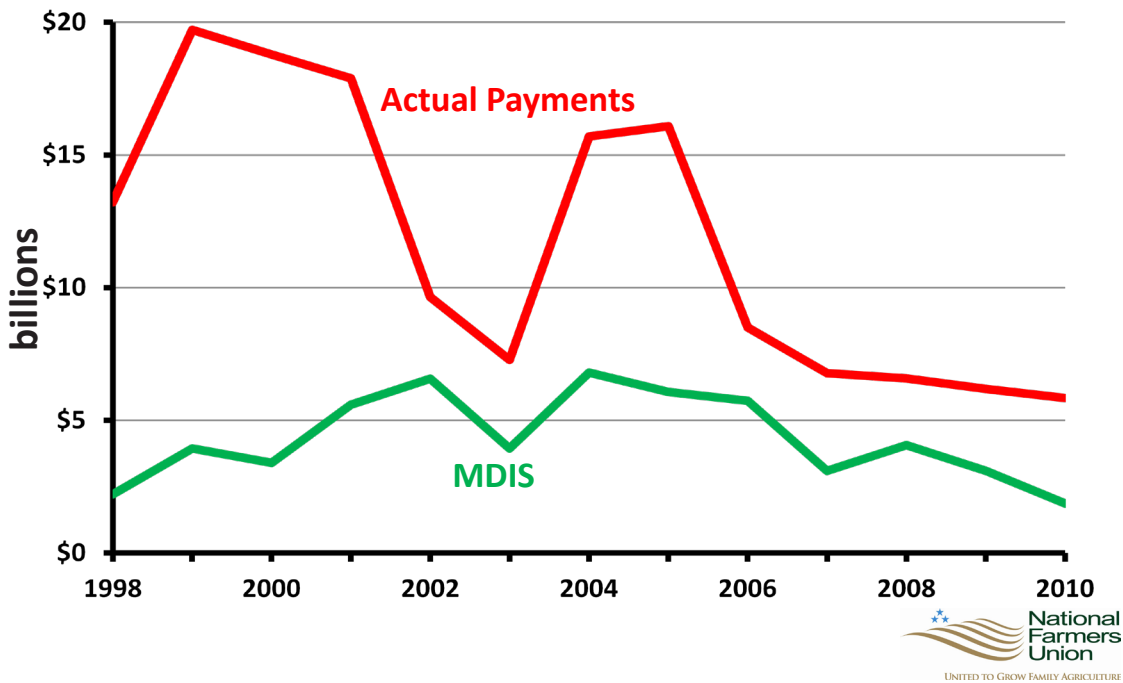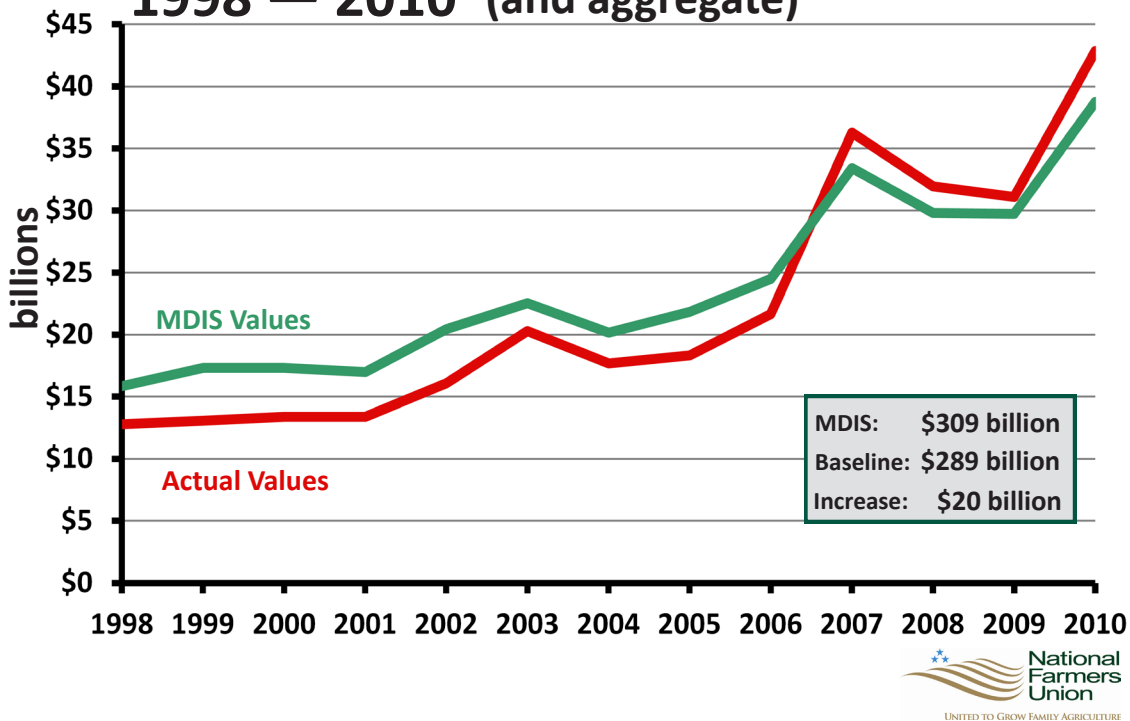
Corn Prices, 1998—2010
Actual and with MDIS

Price per bushel

- Release Price
- MDIS
- Loan Rate
- Actual Prices

1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010

National Farmers Union
UNITED TO GROW FAMILY AGRICULTURE

Yearly Average Prices
1998 — 2010

Price per bushel

Actual Prices
MDIS Policies

	Corn	Wheat	Soybeans
Actual Prices	$2.81	$4.03	$6.96
MDIS Policies	$3.07	$4.51	$8.05

National Farmers Union
UNITED TO GROW FAMILY AGRICULTURE

Government Payments for 8 Crops:
1998 — 2010 (excluding crop insurance)

Actual Payments

MDIS

National
Farmers
Union
UNITED TO GROW FAMILY AGRICULTURE

Annual Value of Exports for 8 Crops
1998 — 2010 (and aggregate)

MDIS Values

Actual Values

MDIS:	$309 billion
Baseline:	$289 billion
Increase:	$20 billion

National
Farmers
Union
UNITED TO GROW FAMILY AGRICULTURE

Corn Prices, 2010—2021

Under several scenarios
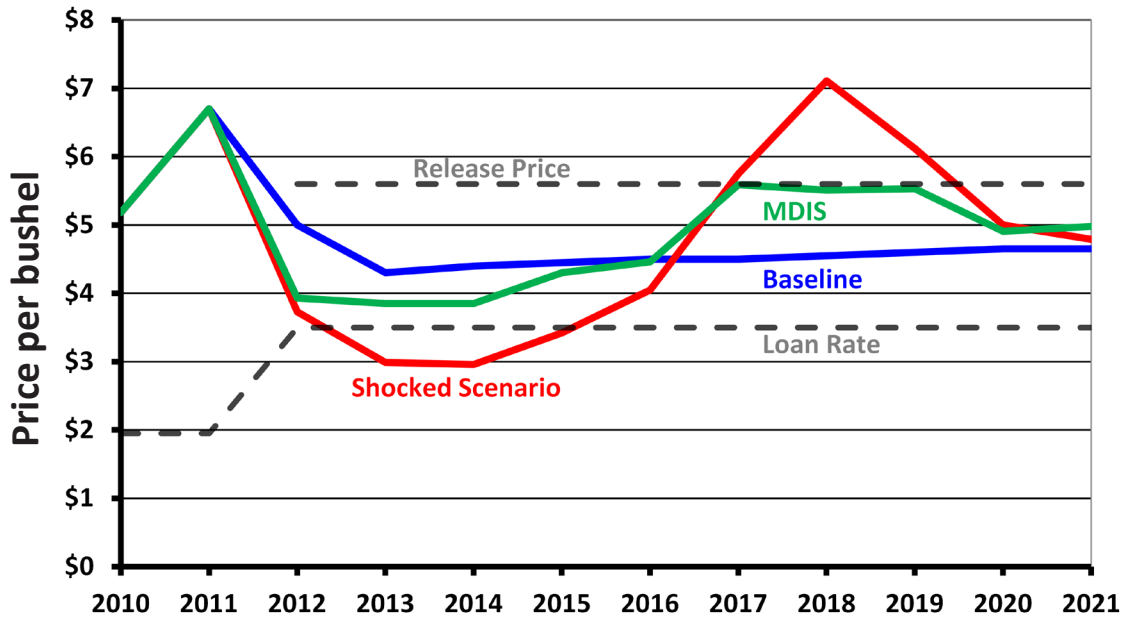
Government Payments for 8 Crops: 2010 — 2021 (excluding crop insurance)