

Current Agricultural Policy's Effects on Water Quality



August 2013

Background

For more than 75 years, market-distorting agricultural subsidies have produced numerous unintended consequences that have degraded water quality and increased costs for industries and communities relying on clean water. When Washington provides subsidies for certain crops and commodities over others, inefficiencies are created and production decisions are altered in favor of subsidized crops. Subsidies tied to current production levels provide incentives for agribusinesses to plant sensitive land that otherwise would likely remain in pasture, grassland, or other less-intensive agricultural uses. **Together, federal subsidies for favored commodities, corn ethanol, and federal crop insurance have shifted unnecessary costs onto taxpayers' backs, with a direct impact on both the short- and long-term conservation of our land and water resources.**

Current Agricultural Policies

While several market-distorting subsidies are scattered throughout federal agricultural policies, we will focus on those that lead to unintended consequences like lower soil and water quality. **The majority of direct payments, price supports, crop insurance subsidies, new income guarantee subsidies, and other disaster and marketing loan payments are handed out to producers of the “big five” crops – corn, soybeans, wheat, cotton, and rice.**¹ Since unlimited crop insurance and shallow loss subsidies are calculated on current production levels, agribusinesses can expand their eligibility and payments if they plant more acres to highly subsidized crops.² In addition, these federal supports enable businesses to concentrate on short-term profitability while not being held accountable for what happens downstream from their farm.

The definitions of several agricultural policies affecting water quality can be found below:

- The **direct payment program** is one of the most wasteful and outdated programs on the books. Enacted in 1996 as a “temporary” support to wean farmers off of federal subsidies, direct payments continue to this day costing taxpayers \$5 billion per year regardless of current crop prices.
- **Price supports** (or counter-cyclical payments) are government-set prices that have been on the books in various forms for decades.
- The **highly subsidized crop insurance program** operates as an income guarantee program for over 120 crops but the majority of subsidies go to the “big five” crops, ensuring that an expected level of income is received every year, regardless of farm income or whether producers even experience a loss of crops.
- **New income guarantee subsidies**, or shallow-loss programs in Washington-speak, have added another layer to the expanding subsidy sandwich, ensuring that producers

receive a government check if crop revenue (prices times yield) falls as little as five or ten percent.

- Other federal agriculture subsidies like **disaster and market loan payments** increase crop revenue and allow agribusinesses to expand farm acreage at taxpayer expense.³
- **Federal mandates and historic subsidies for corn ethanol** encourage production of corn-based biofuels regardless of market conditions, availability of supplies, etc.

Farm Subsidies Alter Agribusinesses' Risk Management Decisions

According to researchers, federal agricultural policies alter agribusinesses' risk management decisions in several ways:

- **Farm payments and unlimited crop insurance subsidies** reduce producers' business risks, increase returns to scale, distribute resources ineffectively, increase agribusiness income, allow farm sizes to increase, and consolidate production in fewer hands.^{4,5}
- More specifically, **direct and counter-cyclical payments** increase liquidity of credit-constrained farmers, influence farm labor decisions, alter land values, and reduce income variability.⁶
- **Crop insurance and shallow loss programs** allow agribusinesses to shift normal risks onto taxpayers' backs since the government picks up on average 62 cents for every 38 cents that producers pay for their own insurance coverage.⁷
- Inflexible **federal biofuels mandates** pick winners and losers, causing producers to expand production and plant certain crops like corn and soybeans over others such as forage crops and fruits and vegetables. Mandates and subsidies also increase demand for biofuel feedstocks, causing crop prices to increase and production to expand onto sensitive land like pasture, grasslands, and highly erodible acres if yields cannot keep up with increasing demand.⁸

Farm Subsidy Impacts on Water Quality

As agribusinesses shift business costs onto taxpayers' backs, perverse incentives often encourage producers to **maximize short-term profits at the expense of long-term productivity**. When Washington picks winners and losers, certain subsidized crops are planted at the expense of others and more acres are brought into production overall. Federal subsidies for crops and corn ethanol have caused producers to become less diversified and plant more acres of corn while plantings of oats, barley, alfalfa, and others decline; in fact, up to six percent more acres are in production because of government intervention in the marketplace.⁹ It's no surprise that the most heavily subsidized crops – corn, cotton, soybeans, and wheat – are the most widely produced crops.¹⁰ But these crops also happen to be the most input-intensive. USDA researchers found that “roughly two-thirds of all fertilizer nutrients are spread on [fields planted to these four crops].”¹¹

Together, these changes have had a direct impact on water quality and land conservation. Researchers note that our **agricultural policies (primarily misguided subsidies) have led to more soil erosion, water pollution, and unnecessary costs for downstream**

users like higher water treatment costs, less recreational opportunities, and lower fishing revenues. More specific effects of federal agricultural policies on water quality are explored below.

Crop Insurance Subsidies

Since agribusinesses are eligible for unlimited crop insurance subsidies and subsidies are based on current production, impacts on agricultural production practices are inevitable. The U.S. Department of Agriculture's Economic Research Service (USDA-ERS) found that the combination of crop insurance, marketing loan, and disaster subsidies increased cropland acreage by about three percent between 1998 and 2007 (but note that these projections fail to account for significant changes in cropland use after the 2007 corn ethanol boom).¹² Other economists estimate that increases in crop insurance subsidies during the 1990s brought 15 million new cropland acres into production (or about five percent of cropland).¹³

Effects of increased income guarantee subsidies are more prevalent in certain areas than others. **States like North Dakota and South Dakota accounted for more than half of all grassland conversions** between 1998 and 2007.¹⁴ Northern Plains agribusinesses also switched from wheat to corn and soybeans more quickly than any other part of the country due to various commodity and crop insurance subsidies. Land in the Dakotas and other marginal land are more likely to have lower soil productivity, higher vulnerability to erosion and nitrogen fertilizer runoff, to include wetlands and lie in the floodplain, and provide habitat for imperiled species (particularly in the Mississippi River Basin).¹⁵ In fact, **crop insurance subsidies increased the rate at which wetlands were drained and converted to crop production:** from 1992 to 1997, income guarantee subsidies were responsible for a fifth of the net loss of non-Federal wetlands.¹⁶ Finally, research has shown that by treating growing areas nearly all the same regardless of land quality, climate, availability of water, and other factors, subsidized crop insurance has altered producers' financial risk calculations resulting in marginally productive land remaining in production and collecting crop insurance payouts.¹⁷

Federal Biofuels Policies

Federal biofuels mandates and historic subsidies for corn ethanol have also spurred changes in the agricultural landscape and resulted in negative effects on water quality. **Despite promises from biofuels proponents, corn yields have not kept pace with increased corn ethanol production.** While corn ethanol production increased nearly eight-fold over the past decade, corn production only increased by 25 percent, mainly due to an increase in corn acreage.¹⁸ States with huge increases in corn acreage (and lower reliance on diversified crop rotations) primarily include those in the lower Mississippi River Basin and dry areas of the Dakotas, Nebraska, Oklahoma, Texas, and Montana.¹⁹ Because corn is the largest user of nitrogen fertilizer and pesticides, nearly half of U.S. inputs are applied to corn (46 and 43 percent, respectively).²⁰ A recent study from South Dakota State University found that biofuels mandates and subsidies from 2006 to 2011 contributed to a loss of 1.3 million acres of grasslands in the Dakotas, Nebraska, Iowa, and Minnesota as more corn and soybeans were planted on acres that had never been cropped before.²¹ Many of these acres were near wetlands,

signaling that worsening water quality conditions are at least partially due to land conversion.

Other Federal Agricultural Subsidies

Other federal agricultural subsidies like direct payments and government-set target prices can have negative effects on water quality. **Direct payments have a direct and significant effect on production decisions**, including the “quantity of acres used in the production of corn, soybeans, and wheat” and on the amount of inputs used.²² **Counter-cyclical payments** also “encourage farmers to plant the program crop for which they have base acreage” (and subsidy eligibility) even if it is riskier to do so.²³ The availability of government-set target prices can then induce agribusinesses to increase nitrogen use by up to 15 percent even if production does not jump by a commensurate amount.²⁴

Nitrogen Runoff Leads to Impaired Water Quality

Nitrogen runoff from farmland has increased over time as more fields were planted to corn, annual rotations were forgone, and more herbicides and fertilizer were used to squeeze the highest yield out of each acre. **Excess nitrogen has impaired water quality, particularly in the Mississippi River Basin**, and increased costs for taxpayers and communities and industries which rely on clean water sources. Agribusinesses often over apply nitrogen fertilizer when planning for ideal growing conditions even though perfect conditions rarely continue throughout the entire growing year. Recently, they have also installed drainage tile beneath fields to accelerate the rate at which water migrates from wetlands or low-lying parts of fields to nearby water bodies. More acres then become suitable for cropland production even though there is a greater likelihood of water pollution due to unfiltered, nitrogen-laden water reaching nearby rivers and streams. USDA’s Natural Resources Conservation Service (NRCS) warns that “tile [drains] are being installed faster than conservation practices are being adopted to address the modified flow of water and nutrients.”²⁵

Government data also shows that **agribusinesses are “failing to apply best management practices** [which] increases the risk that excess nitrogen can move from the field to water resources or the atmosphere.”²⁶ NRCS found that of all U.S. cropland, two-thirds was failing to meet USDA’s criteria for good nitrogen management.²⁷ Better timing and application rates are needed on a high portion of cropland acres in the following watersheds: 86 percent of cropland in the Upper Mississippi Basin, 87 percent in the Chesapeake Bay watershed, 82 percent in the Great Lakes watershed, and 93 percent in the Ohio-Tennessee Basin.²⁸ Since the greatest portion of drainage tile has been installed on corn acres in the MS River Basin, concerns are growing about effects on the Gulf of Mexico’s hypoxic zone and downstream costs for water treatment facilities, industries, and recreational users.²⁹ The greatest concern lies with increased corn plantings since the number of corn acres failing to meet best management criteria increased by 18 percent from 2001 to 2010; in addition, nearly 90 percent of manure-treated corn acres fail to meet minimum nitrogen application standards.³⁰ If corn ethanol mandates and federal subsidies for corn continue or are expanded as Senate and House Agriculture Committees have proposed, the situation will only worsen unless agribusinesses are held accountable for taking care of land and water resources.

Recommendations

Now more than ever, government dollars need to be prioritized and perverse incentives with costly consequences need to be eliminated. Instead of promoting subsidies that shift risks onto taxpayers while incentivizing practices that degrade water quality, Congress must reduce the federal footprint in agriculture by enacting a more cost-effective, accountable, transparent, and responsive agricultural safety net.

For more information, visit www.taxpayer.net, or contact Joshua Sewell, [josh](mailto:josh@taxpayer.net) at [taxpayer.net](http://www.taxpayer.net).

1

http://farm.ewg.org/cropinsurance.php?fips=00000&summpage=FP_BY_YEAR&statename=theUnited States

2 <http://www.ers.usda.gov/publications/eib-economic-information-bulletin/eib79.aspx>

3 <http://www.ers.usda.gov/publications/err-economic-research-report/err120.aspx>

4 http://www.ers.usda.gov/media/176816/eib88_1_.pdf

5 <http://naldc.nal.usda.gov/download/18868/PDF>

6 <http://www.econ.iastate.edu/sites/default/files/publications/papers/p1874-2007-08-22.pdf>,
<http://aep.oxfordjournals.org/content/32/1/170.full.pdf>

7 http://www.ers.usda.gov/media/176816/eib88_1_.pdf

8 <http://www.ers.usda.gov/publications/eib-economic-information-bulletin/eib92.aspx>,

<http://www.ers.usda.gov/publications/eib-economic-information-bulletin/eib79.aspx>

9 <http://www.ers.usda.gov/publications/eib-economic-information-bulletin/eib79.aspx>,

http://www.usda.gov/oce/reports/payment_limits/paymentLimitsAll.pdf

10 http://www.ers.usda.gov/media/176816/eib88_1_.pdf

11 http://www.ers.usda.gov/media/176816/eib88_1_.pdf

12 <http://www.ers.usda.gov/publications/err-economic-research-report/err120.aspx>

13 http://www.ers.usda.gov/media/469928/err25_1_.pdf

14 <http://www.ers.usda.gov/publications/eib-economic-information-bulletin/eib79.aspx>

15 http://www.ers.usda.gov/media/469928/err25_1_.pdf

16 http://www.ers.usda.gov/media/469928/err25_1_.pdf

17 http://www.ers.usda.gov/media/469928/err25_1_.pdf

18 <http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1194>

19 <http://www.ers.usda.gov/publications/eib-economic-information-bulletin/eib79.aspx>

20 <http://www.ers.usda.gov/media/947769/eb20.pdf>

21 <http://www.pnas.org/content/early/2013/02/13/1215404110.full.pdf+html?sid=11181637-caa2-4b09-ad2b-964b57fc7bd1>

22 <http://aep.oxfordjournals.org/content/32/1/170.full.pdf>

23 <http://www.choicesmagazine.org/2005-3/grabbag/2005-3-05.htm>

24 <http://www.econ.iastate.edu/sites/default/files/publications/papers/p1874-2007-08-22.pdf>

25 http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1047813.pdf

26 <http://www.ers.usda.gov/media/947769/eb20.pdf>

27 <http://www.ers.usda.gov/media/947769/eb20.pdf>

28 <http://www.ers.usda.gov/media/947769/eb20.pdf>

29 <http://www.ers.usda.gov/media/117596/err127.pdf>

30 <http://www.ers.usda.gov/media/947769/eb20.pdf>