

ISSUE PAPER

COVERING CROPS:

HOW FEDERAL CROP INSURANCE PROGRAM REFORMS CAN REDUCE COSTS, EMPOWER FARMERS, AND PROTECT NATURAL RESOURCES

In 2012, the land around Emporia, Kansas, was bone dry and full of withered crops. Farmer Gail Fuller's fields were no exception. Hit by the most severe drought since the Dust Bowl of the 1930s, Fuller watched, frustrated, as the sun scorched his hard work. However, Fuller found some solace because he had employed a variety of farming practices that helped the soil retain what little moisture did fall that year, significantly lessening the drought's impact. Even so, his crop yields that year were far lower than average.

So Fuller made a claim on his crop insurance, the federally subsidized program designed to protect farmers from disasters like this one. He thought his crop insurance would help him get through the tough year so he could try to plant again the next year. But he was shocked when the crop insurance company denied his claim.

The insurance company disqualified Fuller for the very practices that allowed him to harvest at least a little bit of his crops and reduced his losses compared with those of some of his neighbors, who were not able to harvest anything. Fuller's experience raises the question: Why would a program intended to help farmers manage risk end up punishing the ones who make smart operating decisions to reduce losses in drought years?

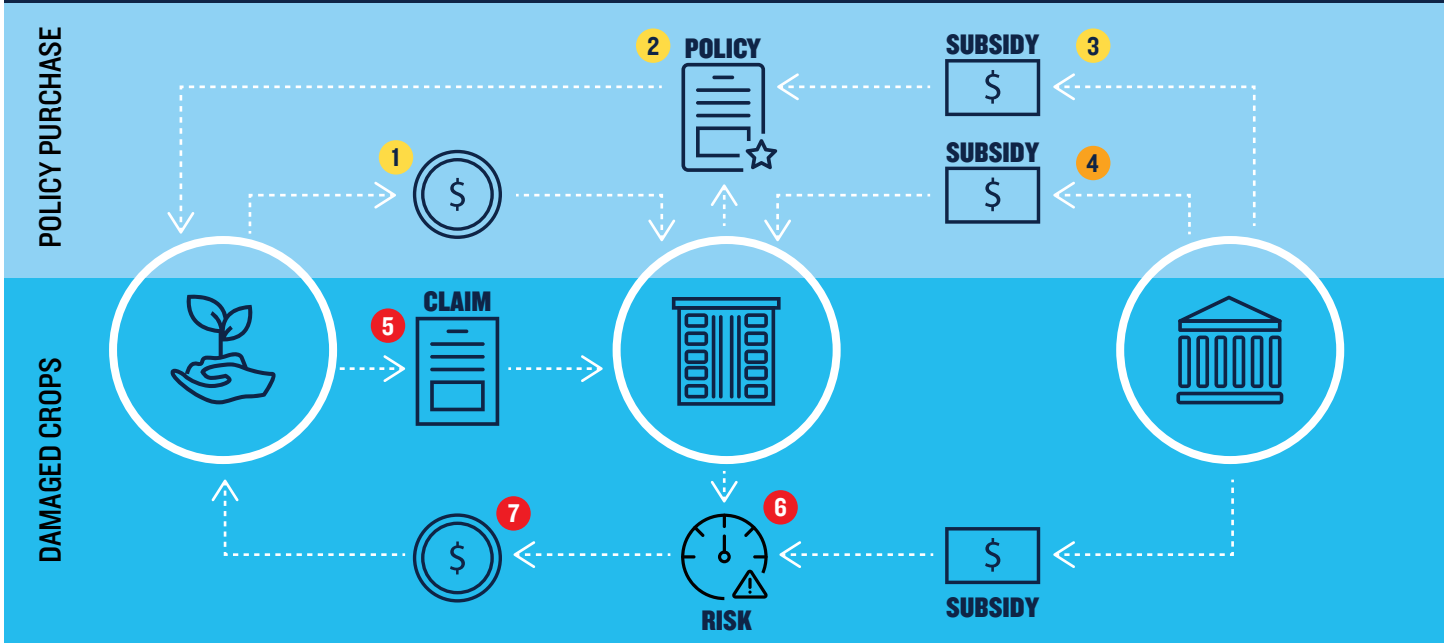
A number of peculiarities in the United States' crop insurance program make it challenging for farmers like Fuller to manage their risk through time-tested practices such as planting a variety of crops or using cover crops. Instead, the program favors farmers whose choices result in total crop loss instead of just reduced yields.



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The result isn't just bad for people like Fuller, who nearly lost his farm because of this crop insurance confusion. It also adds a burden for taxpayers, who helped fund \$13.4 billion in crop insurance costs in 2012, and an average of nearly \$7 billion since then.¹ As climate change causes more frequent and intense extreme weather, taxpayer costs can be expected to climb even higher in the coming years.

HOW THE FEDERAL CROP INSURANCE PROGRAM WORKS



THREE LEVELS OF GOVERNMENT SUBSIDIES

CROP INSURANCE PREMIUMS			COMPANIES	SHARED UNDERWRITING RISK		
1	2	3	4	5	6	7
A farmer buys crop insurance from one of 16 approved private insurance companies	The company provides the farmer with insurance coverage for his revenue or yield, depending on the type of policy	The Government subsidizes about 60% of the premium for the policy	The Government also subsidizes the company's operating costs	When the farmer has damaged crops or low revenue, he submits a claim to the private company that sold him the policy	The Government and the private company share the underwriting risk and the cost of the claim	The private company pays the farmer's claim

We can't afford these losses. Congress is already starting to debate a new Farm Bill, which will shape the Federal Crop Insurance Program (FCIP) for the next several years. This report describes the FCIP, outlines the current issues with the program, and offers several policy solutions Congress should consider to rein in costs and empower farmers to use time-tested risk management methods.

CROP INSURANCE IS THE LARGEST FARM PROGRAM

Instituted in the 1930s, the FCIP was designed to protect American agriculture from reexperiencing the devastation of the Dust Bowl, during which millions of farm families were displaced and lost their land due to a drought not unlike the one in 2012. Thanks in large part to federal crop insurance, the 2012 drought was not as devastating as the Dust Bowl was to the farm economy. Instead, many farmers were able to rely on crop insurance to cover their losses and provide the cash flow needed to plant again the next year. In the past decade, crop insurance has become the most important component of the "farm safety net."

In 2016, more than 290 million acres were enrolled in the FCIP, approximately 80 percent of all U.S. cropland.²

The FCIP insures farmers against economic losses from lower-than-average yields, from low prices, or both. The program represents a partnership between a handful of private insurance companies (which sell and service the policies) and the federal government (which subsidizes farmers' out-of-pocket costs and reimburses the private companies for their operating expenses). On average, approximately 60 percent of farmers' premiums are subsidized by the federal government. The private companies and the federal government share the program's annual profits and losses.

In total, the FCIP cost an average of \$9.2 billion annually from 2012 to 2016, compared with an average of \$5.1 billion annually from 2006 to 2010.³ The FCIP's rapid growth has helped farmers through challenging years like 2012, but it has also exposed the program's weaknesses. If left unaddressed, these weaknesses will result in enormous taxpayer-funded losses and jeopardize important protections for farmers.

CURRENT BARRIERS HINDER BETTER RISK MANAGEMENT IN FEDERAL CROP INSURANCE

The FCIP can be improved to better incentivize and empower farmers to adapt to the risks they face. In particular, key issues preventing farmers from taking action to reduce their risk of loss include the “yield exclusion” option, “prevented planting” provisions, cover crop guidelines, and lack of viable insurance options for diversified farmers.

Yield Exclusion

All farmland is not created equal: One piece of farmland may have better soil, flatter ground, or lower drought risk than another. In some areas, extreme conditions (such as drought and heavy rainfall) worsened by climate change make it difficult for farmers to grow certain crops—even ones that have traditionally been grown in those communities. In these areas, farmers should be encouraged to increase their resilience to extreme weather, perhaps by switching to a hardier mix of crops. Instead, the 2014 Farm Bill instituted a new provision that discourages these farmers from adapting to their conditions.

Under the FCIP, farmers’ premium rates are generally set using a fixed formula that takes yield history into account. On the basis of this formula, a farmer who produces consistently high yields should receive reduced rates, reflecting the low risk of loss. Likewise, inconsistent yields with several years of losses should lead to increased rates. However, the 2014 Farm Bill introduced a new rule that allows farmers to adjust their yield history by throwing out low-yield “outlier” years, providing higher coverage levels (and potentially higher indemnity payments) than would otherwise be available to those farmers. For some crops in some counties, the option to exclude outliers is available for 15 low-yield years, calling into question just how outside the norm those years are.⁴ In 2015, the only year for which data are available, more than 115 million acres of farmland were eligible for yield exclusion, and the option was utilized for more than 21 million acres.⁵

This “yield exclusion” option encourages farmers to take more risks. If they get a decent crop, they can sell more on the market. If their gamble does not pay off, they can fall back on the FCIP and cross that year off the books—and taxpayers are left to foot the bill. The FCIP has attempted to recover yield exclusion costs by charging nominally higher premium rates to farmers who utilize the option.⁶ As a result, however, premium subsidy payments to these farmers also increase, because subsidies are set at a percentage of the total premium charged. The Congressional Budget Office estimates the yield exclusion option costs \$35.7 million annually due to increased premium subsidies.⁷ Furthermore, incentivizing farmers to continue planting crops that fail more often than they succeed does not help them adapt to the realities of farming

in high-risk locations. Over time, losses incurred by these high-risk farmers will only be exacerbated by climate change.

Prevented Planting

The rules that govern “prevented planting” losses also impact the FCIP’s risk. As the term suggests, these losses occur when farmers are unable to plant their crops in a timely fashion. For instance, when soils are too wet, farmers cannot get into the field with heavy equipment, or they risk damaging the ground and getting stuck, so they must wait for the soils to dry out. However, waiting too long will cause a farmer to miss the ideal window for planting, which can result in lower yields. Because farmers’ premium rates are dependent on their yield history—usually some form of an average of up to 10 years of yields—low yields can cause farmers’ rates to spike. If farmers plant a crop later than usual and make a claim for a “partial prevented planting” yield loss, they can replace that year’s yield in their yield history with 60 percent of their average yield, which will raise the deductible for future years. But if a farmer opts for a “full prevented planting loss,” meaning they completely abandoned their field for the year, they can completely exclude that year from the yield history that determines the premium rate, meaning that bad year will have no impact on future rates.⁸ In other words, they are better off planting nothing than having low yields.

This disincentive explains why farmers opt to take a full prevented planting loss 99.9 percent of the time instead of attempting to get a crop in the ground and taking a partial loss, according to an audit by the U.S. Department of Agriculture’s Inspector General.⁹ Again, taxpayers are left with the bill. In the past decade, the FCIP has paid out more than \$9.8 billion in prevented planting indemnities.¹⁰ Worse still, there is no requirement or incentive to protect the abandoned “full prevented planting” acres, which will be exposed to the elements and susceptible to erosion and degradation if nothing is growing there. This degradation can make the land more prone to losses during years when farmers are able to plant a crop there.

Crop Cover Guidelines

Cover crops, which are grown specifically to improve soil quality, can help improve yields, make farms more resilient to drought, and manage pest and disease infestations. In addition, cover crops can help absorb excess springtime moisture, which reduces prevented planting losses. However, the FCIP requires farmers to follow confusing, inflexible guidelines for cover crop management. The agency that administers crop insurance has taken some steps to improve the cover crop rules, such as hosting stakeholder discussions and issuing formal guidance based on the latest cover crop science.¹¹ Unfortunately, these guidelines are complicated and can be difficult to apply,

and even when farmers follow these guidelines correctly, some insurance agents have threatened them with audits.¹² In some cases, companies have refused to grant cover-cropping farmers' claims or even to issue them insurance. This has discouraged some farmers from planting cover crops for fear of losing their insurance, either because the guidelines are too complicated and restrictive or because they are afraid insurers will misapply them. Cover crops are the only farming practice subject to this exacting level of micromanagement; for other production decisions, the program defers to farmers' good judgment about how to best manage their operation.

COVER CROPS

Cover crops are plants grown with the specific purpose of improving soil health. They can include mixes of grasses, brassicas, and legumes and can be planted during the fallow period or seeded alongside commodity crops. Cover crops improve soil biology and the physical structure of the soil by feeding microorganisms and fungi, breaking up soil compaction and providing pores for water absorption with their roots, and protecting the soil surface from erosion. As soil health improves from consistent cover crop use, farms become more resilient during drought and floods.¹³ A five-year survey by the U.S. Department of Agriculture (USDA) revealed that commodity crops planted after cover crops can have higher and more consistent yields, reducing farmers' reliance on crop insurance and the cost of the program for taxpayers and farmers.¹⁴

Crop Diversity Disincentives

Crop diversity is a natural form of risk management that epitomizes the saying "Don't put all your eggs in one basket." Different crops have different growing seasons and are sensitive to different pests. By growing a variety of crops, farmers protect themselves against weather events or pest infestations that affect one crop but not another.^{15,16} Crop diversity can also insulate farmers against volatile prices and rising input costs. Herbicide costs for diverse rotations can be one-tenth of what it costs to treat monocultures, and diversification is one of the strongest protections against the rise of herbicide-resistant "superweeds."^{17,18} Finally, increased crop diversity can lead to more productive land over time, break pest and disease cycles, and help sequester carbon and reduce the effects of climate change.¹⁹

However, monoculture—growing just one or two crops—is now the dominant cropping system in the United States. From 1945 to 2007, the number of acres in the Corn Belt devoted solely to corn or to soybeans increased 29 percent and 80 percent, respectively, while acres devoted to other crops have steadily decreased.²⁰ A number of factors have

led to the expansion of monoculture cropping, and the FCIP is among them. Recent economic modeling suggests that crop insurance leads "continuous corn" cropping in the Corn Belt to increase by more than 100,000 acres, or by about 4 percent.²¹

Several aspects of the FCIP make it harder and more expensive for farmers to grow a diverse set of crops, thus contributing to the growth of monoculture. For example, for the most popular FCIP policies, farmers must sign up for individual coverage of each crop in each county. In other words, the more crops a farmer grows, the more difficult it is to sign up for coverage. Furthermore, if farmers decide to incorporate new crops into their rotations, their deductibles will increase, and their insurance will be more costly until a yield history is established; the more crops in the rotation, the longer this process takes.²² Additionally, coverage is not even available for some niche crops, which disincentivizes incorporating those crops into rotations.²³

The 2014 Farm Bill introduced a new product called Whole Farm Revenue Protection, which aimed to remove some of these barriers for diversified farmers. This policy insures the entire farm revenue regardless of the combination of crops and livestock produced. But participation in the program is still low, accounting for just 2 percent of the program's liabilities in 2016.²⁴ The low enrollment has been attributed both to a lack of awareness of program availability among farmers who could benefit from Whole Farm Insurance, and to a lack of promotion and understanding of the product by insurance agents.²⁵

Monoculture cropping may drive up FCIP costs by driving down crop prices. Most farmers purchase FCIP policies that protect them from declining prices. These "revenue protection" policies are the most popular FCIP offerings, with nearly 70 percent of farmers opting for this type of coverage.²⁶ As a result, when prices decline FCIP payments rise. And with so many acres devoted to corn and soybeans (which is partially due to incentives embedded within the FCIP), there is a risk of an oversupply of these two crops, which could suppress prices and trigger payments.²⁷ Over the past decade, the FCIP has paid out nearly \$6.5 billion in indemnities due to low prices.²⁸ Ironically, the program intended to insulate farmers from low prices could contribute to a glut of supply, which causes prices to fall and payouts to rise.

Climate change will drive up the cost of the FCIP

Over the past two decades, insured corn has demonstrated 67 percent greater sensitivity to extreme heat than uninsured corn, and the sensitivity to extreme heat for insured soybeans has been 43 percent higher than for uninsured soybeans.²⁹ Heat sensitivity means that high temperatures are more likely to negatively impact yields. The higher extreme heat sensitivity of insured crops is

likely due to the fact that farmers stop trying to adapt to extreme conditions when yields drop below the level that triggers indemnity payments, because insurance covers any further losses. As a result, total indemnified losses are higher.³⁰ This problem is likely to only worsen as climate change increases the frequency of extreme heat.³¹

Rising temperatures are likely to result in decreased crop yields and increased yield risks, which would increase premium rates. Because premium subsidies are currently set as a fixed percentage of the premium rate, higher premiums translate into increased federal subsidies and higher costs for farmers. Under a 1°C warming scenario, annual FCIP subsidies for all covered crops could increase by \$850 million (or 13 percent).³² Under a 2°C scenario, annual subsidies could increase by \$2.2 billion (or 34 percent).³³ Modeling by the USDA also indicates that climate change will spur significant fiscal impacts to the FCIP. Under an unmitigated climate change scenario in which temperatures rise by nearly 4°C by 2080, annual premium subsidy costs for corn, soybeans, and wheat are projected to increase by 40 percent, or \$4.2 billion.³⁴ These increased costs reflect higher premiums due to



higher yield and price risks, as well as risks related to changing production decisions. For example, some farmers may expand production onto higher-risk land, which could produce more revenue but which also have higher premiums. Climate change may lead to decreased irrigation as water supplies run dry, and farming without irrigation is generally more costly to insure than irrigated production. Acreage shifting due to climate change may result in reduced crop diversity, which increases loss risk.³⁵

CLIMATE CHANGE'S IMPACT ON AGRICULTURE

Over the past 35 years, temperatures in the contiguous 48 states have warmed at a faster rate than the global average.³⁶ Many areas in the Great Plains and Midwest have seen a 10 to 20 percent increase in total annual precipitation since the early 20th century, with a particular increase in heavy rainfall events, which can damage crops, erode soil, and increase flood risks.³⁷

Variations in temperature and precipitation have a profound impact on crop yields. Over the past few decades, climate variability has accounted for about one-third of the global yield variability for major commodity crops like corn, rice, wheat, and soybeans.³⁸ And in some of the world's major production regions, climate variability has exerted an even greater influence. For example, more than 60 percent of the yield variability for parts of the midwestern United States is explained by fluctuations in temperature and precipitation.³⁹ Further, despite advancements in crop genetics and agronomic practices, the sensitivity of corn—the most widely planted crop in the United States—to drought conditions has increased in recent decades.⁴⁰

Recently observed trends in extreme weather and climate change are only expected to worsen in the future. Temperature increases of 1.8°F to 5.4°F in the United States by midcentury, along with more extreme precipitation, are expected to negatively impact yields of major crops as well as farm profits.⁴¹ While warmer temperatures will likely increase the length of the growing season and may expand production to new areas, the overall impact on major crop yields is expected to be negative.⁴² Crops have specific temperature tolerances that determine where they can be grown and specific temperature ranges in which they grow best.⁴³ Climate models for July in the Midwest project higher temperatures and lower relative humidity over the next 50 years. Due to the growing drought sensitivity of corn, these changes could reduce corn yields by 15 to 30 percent.⁴⁴

TABLE I: PROJECTED IMPACTS OF CLIMATE CHANGE ON AGRICULTURE.⁴⁵

PROJECTED CHANGE	POSSIBLE IMPACT ON CROPS
Increased atmospheric CO ₂	Near-term increase in yields of some crops, like soybeans
Warmer temperatures	Longer growing season, new areas for production, declining yields from heat stress
Increased precipitation	More water available for crops, but fields may be too wet for planting
More frequent and intense heavy rainfall events	Decreased yields due to flooding and erosion of fields
Decreased precipitation/more drought	Increased demand for irrigation, but groundwater depletion and less water available for irrigation

Source: Jerry Hatfield et al., "Agriculture."

According to the U.S. Government Accountability Office, the total federal exposure under the FCIP has increased dramatically in recent years. From 2007 to 2013, the total value of crops insured under the program increased by 68 percent—the greatest increase of all federal property insurance programs.⁴⁶ The increase in federal exposure under the FCIP, coupled with agriculture’s inherent vulnerability to changes in climate and extreme weather, could foreshadow increased losses in the coming decades. In the past five years alone (2011 to 2015), the FCIP paid out more than \$42 billion in claims to crop losses due to extreme weather and climate change.⁴⁷

REFORMS COULD STRENGTHEN FEDERAL CROP INSURANCE AND REDUCE TAXPAYER COSTS.

Congress should reward farmers who proactively address climate change risks and practice holistic risk management, instead of continuing along a downward spiral with increasing crop loss and ballooning federal expenditures. Discussions around the next Farm Bill have already begun, providing an opportunity to reform the FCIP—all while saving taxpayer dollars and reaping environmental benefits. NRDC recommends the following changes to the FCIP.

TABLE 2. CROP INSURANCE LOSSES AND ACRES AFFECTED BY THE FIVE COSTLIEST CAUSES RELATED TO EXTREME WEATHER AND CLIMATE CHANGE (2011–2015). DISCREPANCIES DUE TO ROUNDING.⁴⁸

CAUSE OF LOSS	CLAIMS PAID (\$)	ACRES AFFECTED
Drought	24.1 billion	142 million
Excess Moisture/Precip/Rain	12.2 billion	80.7 million
Heat	3.0 billion	13.6 million
Hot Wind	1.1 billion	4.1 million
Failure of Irrigation Supply	980 million	1.9 million
TOTAL	\$41.3 BILLION	242 MILLION

Source: Calculated using 2011–2015 data from RMA, “Cause of Loss Historical Data Files.”



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A NEW INCENTIVE FOR COVER CROPS IN IOWA

Because cover crops are a proven method for reducing nitrates from farm runoff in water supplies, Iowa's Department of Agriculture and Land Stewardship collaborated with the USDA's Risk Management Agency to develop an incentive for cover cropping through federal crop insurance. This innovative program, which will be available for the 2018 crop year, attempts to use the popularity of federal crop insurance to encourage additional farmers to try cover crops.

Iowa will fund the incentive through its Water Quality Initiative, which invests millions of dollars annually in improving water quality. A significant portion of that budget goes toward helping farmers recoup the upfront costs of cover crops, such as seed costs, offering farmers an average of about \$25 per acre. However, a national USDA cover crop survey indicates that crop insurance incentives would encourage more farmers to try cover crops, perhaps at a fraction of the price of cost-share programs. So the state and the RMA worked together to utilize a provision of the Federal Crop Insurance Act that authorizes states to offer a premium subsidy, in addition to the one offered by the federal government.⁵¹ Iowa's additional subsidy, which offers \$5 per acre to any farmer who planted cover crops on that acreage in the previous year, could encourage many more farmers to try cover crops.

The willingness of state and federal agencies to embrace a new approach helped to make this innovative program a reality. Local farm and environmental groups, including Practical Farmers of Iowa, the Iowa Farmers Union, and the Iowa Environmental Council, have shown strong support for the initiative and will help the state and the RMA with promotion and implementation. A program like Iowa's could be replicated in other states that wish to make a similar investment in cover crops, or implemented more broadly through the Farm Bill.

Remove the yield exclusion option

Everyone experiences a bad year on occasion. But when certain crops in certain areas fail more often than they succeed, it does no good to encourage farmers to try again, rather than to adapt to the challenging conditions and try a new strategy. The misguided yield exclusion option should be eliminated.

Reform prevented planting rules

Prevented planting rules should be reformed to encourage farmers to mitigate their losses when conditions keep them from getting their crops into the ground. Instead of allowing farmers to completely exclude prevented planting years from their yield history, the rules should assign a yield even in years when a full prevented planting loss is incurred. The rules should also encourage farmers to adopt practices that reduce the risk of these losses, such as cover cropping, either by requiring cover crops during years when a full prevented planting loss is incurred or by assigning higher yields to farmers who use cover crops.⁴⁹

Reform cover crop guidelines and educate insurance providers about cover crops

The cover crop guidelines should be reformed to remove unnecessary barriers. These guidelines unnecessarily restrict how farmers manage cover crops and stigmatize cover crops as "risky." Instead, the federal Risk Management Agency (RMA), which administers the FCIP, should instruct insurance providers to defer to the same "good farming practice" determinations used for all other management decisions.

Furthermore, since prejudicial behavior against cover crop farmers seems to have originated with local insurance agents, the RMA should issue clear guidance to all companies and agents that farmers who follow good farming practices should receive prompt payment on any indemnity claims.

Collect data that will help assess how management affects loss profile

A new set of practice codes should be established to collect information about how on-farm decisions impact the risk of crop loss. Currently, the RMA collects only very basic information, such as yield, irrigation status, and whether a farmer uses organic or conventional growing practices. As a result, the agency does not have actuarial data that allow it to incentivize low-risk practices. NRDC recommends new practice codes for:

- Cover crops
- Crop rotations, and
- Comprehensive soil health,

Additional details from these data would help the RMA assess how on-farm management affects the risk of crop loss, allow the agency to offer actuarially justified rate adjustments for farmers based on their management practices, and ultimately encourage more farmers to adopt risk-reducing practices.

Pilot cover crop and diversified farming incentive programs in key watersheds

Pilot incentive programs should be established for cover crops and diversified crop rotations in key watersheds.

Under existing law, states could offer a relatively inexpensive additional crop insurance subsidy of \$5 or less per acre for farmers who agree to plant cover crops or use three- or four-year rotations. Although a number of state and federal programs will reimburse farmers for a portion of the costs to adopt conservation practices, these traditional cost-share incentives can run to \$25 per acre or more. A national survey has shown that crop insurance incentives could strongly encourage conservation practices, perhaps at a fraction of the cost.⁵⁰ Alternatively, Congress could provide new authority for the RMA to establish these types of pilot programs, which could also be used to collect data about how on-farm management affects risk of crop loss.

Increase participation in Whole Farm Revenue Protection

The USDA should coordinate with farmers on increasing enrollment in Whole Farm Revenue Protection and working with insurance providers to ensure they understand the product and promoting it.⁵²

REFORMING FEDERAL CROP INSURANCE TO INCENTIVIZE SOIL HEALTH-BUILDING PRACTICES WOULD SAVE TAXPAYER DOLLARS.

Federal crop insurance has become a foundational component of many farmers’ risk management strategies, allowing them to weather difficult years like 2012. However, the program has weaknesses that will only be worsened by climate change. These problems add up to an expensive bill for taxpayers—nearly \$9 billion annually.

The solutions NRDC proposes in this report would not eliminate the entire bill. After all, bad years happen. But these commonsense changes would significantly reduce the cost of the FCIP by empowering farmers to manage risk with their own good farming judgment and would ensure that the program remains a strong safety net during challenging years.

TABLE 3: SOLUTIONS TO REDUCE ANNUAL COST OF FCIP.

PROBLEM	ANNUAL FCIP COST (SUBSIDIES AND GOVERNMENT’S SHARE OF INDEMNITIES)	NRDC SOLUTIONS TO REDUCE COSTS
Planting on Marginal Ground	\$36 Million ⁵³	Eliminate yield exclusion provision
Prevented Planting Losses	\$568 Million ⁵⁴	Reform prevented planting rules, remove cover crop termination guidelines, collect data about cover crops, work with states to pilot incentives for cover crops
Eliminating Crop Rotation	\$490 Million ⁵⁵	Increase Whole Farm Revenue Protection participation, collect data about crop rotations, work with states to pilot diverse rotation incentives
Climate Change and Extreme Weather	\$7.6 Billion ⁵⁶	Collect data about cover crops and diverse rotations, work with states to pilot incentives for diverse rotations and cover crops
TOTAL	\$8.7 BILLION	

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- 22 New crops are given a “transitional yield” (or “T-yield”) rate until a farmer establishes four years of that particular crop. T-yields are usually lower than actual yields, resulting in higher effective deductibles. The more crops in a rotation, the longer it takes to establish a rate based on actual yields. For example, if a farmer grows only corn, he can replace the T-yield in four years. If a farmer grows corn, soybeans, barley, and alfalfa, it will take 16 years to replace the T-yield (4 crops x 4 years per crop). See 7 USC 1508(g)(2)(B).
- 23 See RMA, “2017 Crop Policies and Pilots,” <https://www.rma.usda.gov/policies/2017policy.html> (accessed August 2, 2017).
- 24 RMA, “Federal Crop Insurance Corporation Commodity Year Statistics for 2016 as of: May 1, 2017.”
- 25 Kranti Mulik, *Rotating Crops, Turning Profits*.
- 26 RMA, “Federal Crop Insurance Corporation Commodity Year Statistics for 2016 as of: May 1, 2017.”
- 27 Myra P. Saeftong, “Soybean Prices Set for Lowest Finish in About a Year After USDA Report,” *Market Watch*, April 11, 2017, <http://www.marketwatch.com/story/soybean-prices-set-for-lowest-finish-in-about-a-year-after-usda-report-2017-04-11>; Kevin Van Trump, “See How the Game Could Quickly Change for Corn Prices,” *Corn and Soybean Digest*, June 7, 2017, <http://www.cornandsoybeandigest.com/planting/see-how-game-could-quickly-change-corn-prices>.
- 28 RMA, “Cause of Loss Historical Data Files.” It is important to note that the government shares these losses with the private companies that administer the program so the total taxpayer cost is not this high. However, it is useful to understand the full scope of farmers experiencing “decline in price” losses. In general, the government pays about 60 percent of annual indemnities and the private crop insurance companies pay the other 40 percent See RMA, “Reinsurance Reports Online.”
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49 Personal communication with Ferd Hoefner, Senior Strategic Advisor, National Sustainable Agriculture Coalition, April 20, 2017.

50 USDA, Sustainable Agriculture Research and Education, *2013-2014 Cover Crop Survey Report*, 2014, <http://www.sare.org/Learning-Center/From-the-Field/North-Central-SARE-From-the-Field/2013-14-Cover-Crops-Survey-Analysis>.

51 7 U.S.C. § 1508(c)(8).

52 Kranti Mulik, *Rotating Crops, Turning Profits*, note 16.

53 Estimated annual cost of yield exclusion provision. GAO, *Crop Insurance: In Areas with Higher Crop Production Risks, Costs Are Greater, and Premiums May Not Cover Expected Losses*, 2015, 10, <http://www.gao.gov/assets/670/668358.pdf>.

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55 Average government-paid losses due to decline in price 2011-2015. Calculated using RMA, "Cause of Loss Historical Data Files." Because the government shares the risk of loss with private companies, not all indemnities are paid with taxpayer dollars. Amount of indemnities paid by government were calculated using 2011-2015 data from RMA, "Reinsurance Reports Online." Determined percentage of annual total indemnities paid by government for each year and multiplied by total value of decline-in-price losses, before averaging to develop annual cost estimate.

56 Includes both increased premium subsidies under a 2°Celsius warming scenario and government-paid indemnities from extreme weather losses. Increased premium subsidies from Jesse Tack, Keith Coble, and Barry Barnett, "Warming Temperatures Will Likely Induce Higher Premium Rates." Indemnities from extreme weather were calculated using 2011-2015 data from RMA, "Cause of Loss Historical Data Files." Causes of loss include drought, excess moisture/precipitation/rain, excess sun, failure of irrigation supply, flood, heat, hot wind, hurricane/tropical depression, and inability to prepare land for irrigation. Because the government shares the risk of loss with private companies, not all indemnities are paid with taxpayer dollars. Amount of indemnities paid by government were calculated using 2011-2015 data from RMA, "Reinsurance Reports Online." Determined percentage of annual total indemnities paid by government for each year and multiplied by total value of extreme weather losses, before averaging to develop annual cost estimate.