

TAXPAYERS, CROP INSURANCE, AND THE DROUGHT OF 2012

**ENVIRONMENTAL
WORKING GROUP**

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About EWG

The mission of the Environmental Working Group (EWG) is to use the power of public information to protect public health and the environment. EWG is a 501(c)(3) non-profit organization, founded in 1993 by Ken Cook and Richard Wiles.

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PREFACE

BY CRAIG COX

VICE PRESIDENT FOR AGRICULTURE AND NATURAL RESOURCES, EWG

THERE WERE TWO REASONS THAT ENVIRONMENTAL WORKING GROUP (EWG) COMMISSIONED AGRICULTURAL ECONOMIST BRUCE BABCOCK OF IOWA STATE UNIVERSITY TO ANALYZE HOW THE HEAVILY SUBSIDIZED FEDERAL CROP INSURANCE PROGRAM PERFORMED DURING THE CORN BELT DROUGHT OF 2012.

First, the 2012 drought drastically cut crop yields across several states – just the kind of event that many economists agree justifies a role for taxpayers in providing farmers with a safety net. Second, Congress is about to take up the farm bill again under serious pressure to cut spending. The taxpayer cost of crop insurance has grown steadily since 2000 and now is the most expensive government program supporting farm income. EWG thought the 2012 drought would be the perfect case to test whether it's possible to save federal tax dollars while still providing an effective safety net for farmers facing potentially crippling losses.

Dr. Babcock's conclusions should be a wake-up call for taxpayers and the senators and representatives in Congress charged with creating a more fiscally responsible safety net. His key findings:

- Over-generous subsidies have turned crop insurance into more of a farm income support program than a risk-management program.
- Taxpayers could provide farmers with a secure

floor under their finances for less than half of what the current program costs.

- Although avoiding *ad hoc* disaster relief expenses has been one of the most-often cited justifications for subsidized crop insurance, the current insurance program cost taxpayers far more in 2012 than traditional disaster relief would have.
- Taxpayers will bear the burden of almost 75 percent of the 2012 insurance payouts; and since 2001, insurance companies have enjoyed \$10.3 billion in underwriting gains – while taxpayers have lost \$276 million.

This latest report from Bruce Babcock adds to the growing evidence that common sense reforms to crop insurance would save billions of dollars while still providing a solid safety net, cutting the deficit and investing in programs that improve human health and the environment. So far, however, the subsidy lobby has managed to push Congress in the opposite direction. If either the failed Senate or House Agriculture Committee farm bill proposals from last year were to become law, taxpayers would be asked to pay even more for crop insurance while funding for conservation and nutrition programs went under the budget knife.

Congress should and could do far better as it takes up the farm bill again this year.

FULL REPORT

Taxpayers, Crop Insurance and the Drought of 2012

BY BRUCE BABCOCK PH.D.

PROFESSOR OF ECONOMICS, IOWA STATE UNIVERSITY

LOW FARM YIELDS IN CORN BELT STATES DUE TO THE 2012 DROUGHT HAVE LED TO THE HIGHEST CROP INSURANCE PAYOUTS IN HISTORY. PAYOUTS (INDEMNITIES) FOR THE YEAR WILL EXCEED \$16 BILLION, AN ALMOST 50 PERCENT JUMP FROM THE THEN-RECORD \$10.8 BILLION PAID OUT THE YEAR BEFORE.

The big payouts are hardly surprising. A large proportion of US crop acreage is now insured, and farmers experienced record-breaking droughts and prolonged periods of hot temperatures during the growing season in both years. Furthermore, high commodity prices made the insured crops more valuable, driving up the size of the payouts.

Supporters of the current crop insurance program argue that the record-setting payouts show that the program is working exactly as it should: by covering farmers' losses, the insurance provided the financial safety net that they need to be able to pay their bills and survive to plant another crop.

But the truth is very different. A close analysis reveals that crop insurance as it is currently structured and marketed is a bloated, taxpayer-funded income support program that in many cases allows growers, particularly the industrial-scale operations that have been enjoying record profits, to make more money from insurance payouts than they would from a healthy harvest.

There's no question that farmers, who must cope with the vagaries of weather and other difficult-to-predict

risks, deserve a safety net. And a properly structured insurance program that worked like other types of insurance would provide that safety net.

But crop insurance is not like the auto, health and property policies sold by private companies to customers who value the coverage and pay a premium that is adequate to cover their possible losses and the insurers' processing costs, as well as to generate a profit for the agents and the companies. Those companies, in turn, control their risk exposure by buying private reinsurance when needed and by managing their portfolio of policies.

In contrast, the premiums paid by farmers for crop insurance cover only 40 percent of the anticipated payouts. It is taxpayers who foot the bill for the other 60 percent, along with delivery costs, agent commissions and company profits. Taxpayers also shoulder a large share of the losses when payouts exceed premiums, as they did in 2012. Because tax dollars finance such a large share of the costs, farmers' decisions about how much and what type of insurance to buy do not reflect their true valuation of the insurance. And because taxpayers take much of the hit for excess losses, insurance companies' decisions on what types of policies to sell likely do not reflect prudent risk management. In addition, the ability of insurance companies to manage their risk is restricted by the government's requirement that companies must sell crop insurance to all farmers who want it.

Overall, taxpayers' outsized support makes crop insurance more of a farm income support program than an insurance plan. And because it is the government's costliest farm program, it is important to assess whether taxpayers are getting good value

for their dollars. The answer is no. Taxpayer subsidies distort farmers' insurance choices and inflate the program's costs.

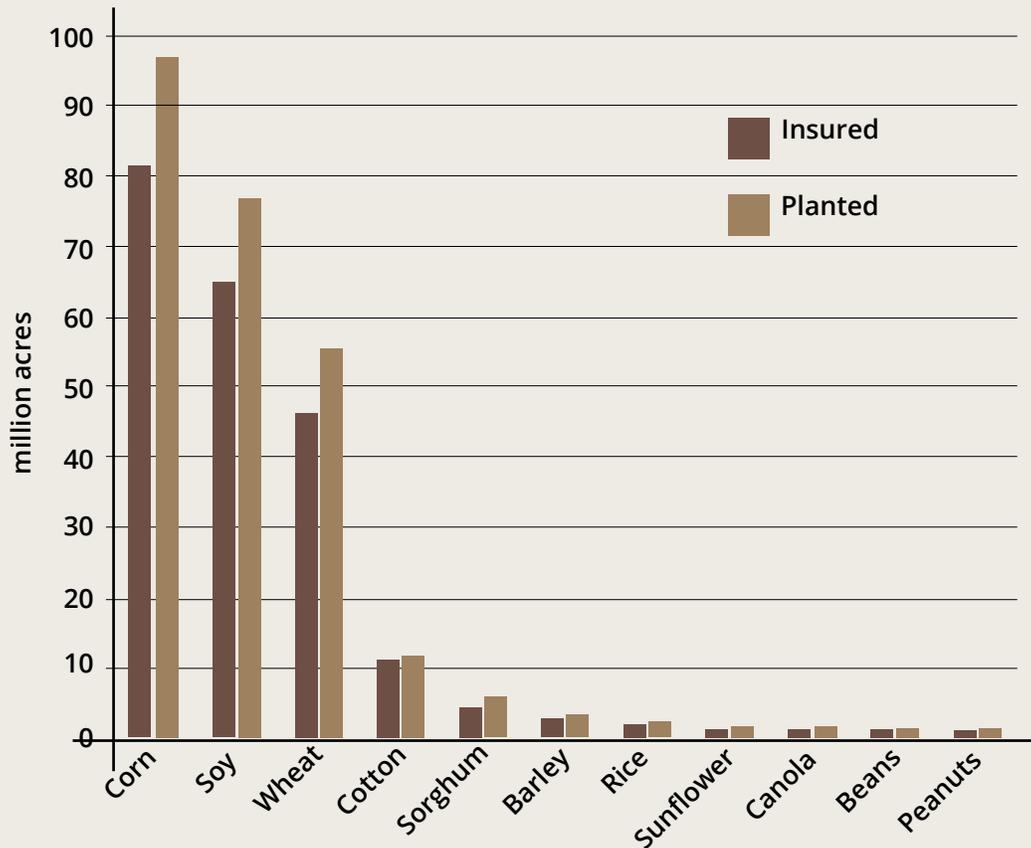
The detailed analysis that follows shows that because of the taxpayer subsidies, farmers have powerful incentives to buy "Cadillac" insurance policies that dramatically drive up the cost of the program. Without those subsidies, for example, corn and soybean crop insurance payouts would have been just over \$6 billion in 2012 – less than half of the actual amounts. And farmers would still have had a solid floor under their revenues – a far more cost-effective farm safety net.

CROP INSURANCE IN 2012

There is no better place to begin this analysis than by reviewing how crop insurance performed in the drought year of 2012.

Figure 1 shows the number of acres insured and planted in 2012 for the 11 crops with the most insured acreage. Fully 84 percent of planted acreage for these 11 crops was insured. Overall, they represent about 95 percent of total insured crop acreage. The top five crops clearly dominate the crop insurance program, accounting for 90 percent of total insured acreage, 87 percent of total premiums paid and 82 percent of the total amount of insurance purchased in 2012.

Figure 1. Insured and Planted Crop Acreage, United States



Source: USDA: Risk Management Agency Summary of Business Reports and National Agricultural Statistics Service

There are three major insurance products available for growers of these five crops. Yield Protection (YP) policies cover losses due to low yields. Revenue Protection-Harvest Price Exclusion (RP-HPE) protects against low revenue. Revenue Protection (RP) combines the two, protecting against losses due to low prices when prices drop and against low yields when prices rise.

A farmer's crop insurance guarantee is set before planting. It is determined by the projected harvest time price of the crop and the farmer's history, which is used to estimate the expected yield. The following example of how the different products work is based on the case of a corn farmer with an expected yield of 200 bushels per acre and a springtime-projected 2012 harvest time price of \$5.68 per bushel.

YP: Insuring Against Low Yields

Under a yield protection policy, a farmer's buys insurance against low yields. The yield guarantee equals the product of a farm's expected yield level and the coverage level the farmer selects. Coverage levels range from 50 to 85 percent in 5 percent increments. With an expected 200-bushel yield, the farmer in this example can select a yield guarantee of from 100 to 170 bushels per acre.

In the fall, the farmer's harvested yield per acre is compared to the yield guarantee to determine whether an insurance payment is due. If the harvested yield is less than the guaranteed yield, there is a payout equal to the yield guarantee minus actual harvested yield (the yield loss) multiplied by the projected harvest price.

When defenders of crop insurance cite crop disasters brought about by drought, flood, wind or pestilence to argue that crop insurance is necessary to protect farmers from the vicissitudes of nature, they're talking about YP policies, the type that protects against these disasters. But very few farmers actually buy YP. Instead, they buy protection against revenue declines, not just yield declines. The two products that protect revenue are RP-HPE and RP.

RP-HPE: Pure revenue insurance

With an RP-HPE policy, a farmer chooses to protect dollars per acre, rather than bushels per acre. Available policies guarantee from 50 to 85 percent of projected revenue, which equals springtime projected crop price times expected yield. Thus the corn farmer in our example could select revenue guarantees ranging from \$568 to \$965 per acre.

Come fall, the harvested yield per acre is multiplied by the actual (not the projected) harvest price to determine harvest revenue. This harvest revenue is compared to the revenue guarantee to determine whether there should be a payout. If the harvest revenue is lower than the guarantee, the policy payout makes up the difference.

Some farmers may prefer a revenue guarantee to a yield guarantee because they typically pay production expenses in dollars, not bushels. Even a bumper crop might not generate adequate revenue to pay the bills if the harvest price turns out to be much lower than anticipated.

Advocates of crop insurance seldom tout the benefits of protection against lower-than-expected market prices, perhaps because a grower has more ways to protect against low prices than against low yields. A farmer can use "forward contracts" to lock in a price well before a crop is planted, or, if he or she doesn't want give away upside price potential, use "put options" on futures contracts as price insurance.

RP-HPE provides pure revenue insurance, since any combination of yield and harvest price that generates revenue below a farmer's revenue guarantee triggers a payout. If the combination of price and yield generates revenue that exceeds the guarantee, there is no payout. In 2012, for example, low corn yields increased the harvest price to \$7.50 per bushel. Our 200-bushel corn farmer who purchased an 80 percent revenue guarantee under RP-HPE (at \$908.80 per acre) would not have received a payout if his harvested yield exceeded 121.2 bushels per acre ($908.80/7.5 = 121.2$). In contrast, the farmer would

have received a YP payout for any yield lower than 160 bushels per acre. That's because the higher harvest-time price is reflected in the calculation of a farmer's loss under pure revenue insurance, but not under yield insurance. This feature of RP-HPE makes for efficient insurance, because it appropriately reduces payouts when prices rise. But the very features that make RP-HPE efficient for taxpayers make it unpopular with farmers.

RP: The Cadillac Crop Insurance Policy

From a farmer's perspective, the problem with Yield Protection is that it does not protect against low prices, and the problem with RP-HPE is that its coverage against low yields is reduced if harvest prices are higher than projected. RP does away with these perceived problems by combining the coverages provided by YP and RP-HPE. RP provides pure revenue insurance when the harvest price falls and pure yield insurance when it rises. Furthermore, when the harvest price increases, yield losses are valued at the higher actual market price rather than the projected price.

If the farmer with the expected 200-bushel-per-acre yield had purchased 80 percent RP and harvested just 125 bushels per acre, the yield loss would have been 35 bushels ($0.8 \times 200 - 125 = 35$) and the RP payout would have been \$262.50 per acre ($35 \times 7.50 = 262.50$). The Cadillac nature of this coverage becomes obvious when you compare what the payouts would have been under YP and RP-HPE. If the farmer had purchased 80 percent YP, then the payout would have been \$198.80 per acre. If the farmer had purchased 80 percent RP-HPE, there would have been no payout at all, because the price increase generated enough extra revenue to compensate for the yield loss.

Of course, Cadillac coverage comes with a Cadillac price. A simple analysis of costs and benefits easily explains why farmers overwhelmingly choose this type of coverage.

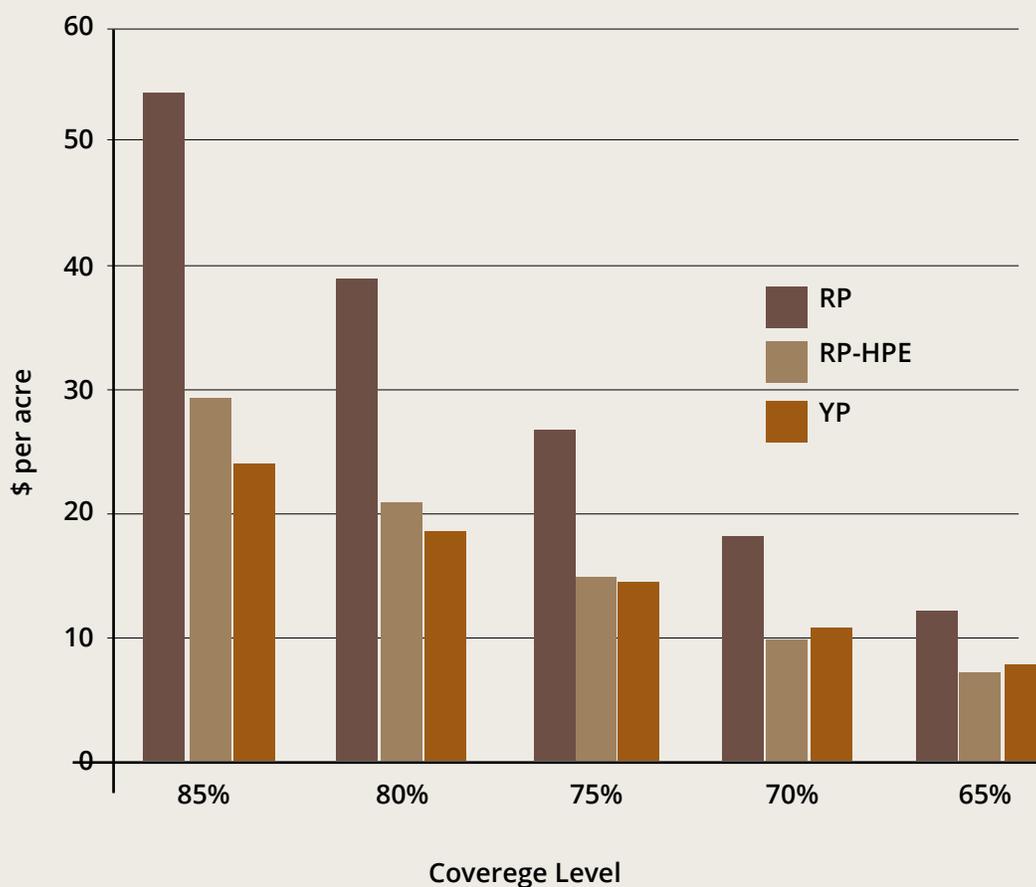
PREMIUMS AND SUBSIDIES

Figure 2 shows the per-acre insurance premiums in 2012 for a corn farmer in Champaign County, Ill. – a county hard-hit by the 2012 drought – who had an expected yield of 200 bushels per acre. RP premiums averaged 80 percent higher than RP-HPE and 90 percent higher than YP across the coverage levels shown.¹ If crop insurance were like other insurance markets, one would expect that farmers who paid higher premiums for the Cadillac policies did so because they valued the additional coverage more than the cost of the premiums they paid. If they didn't, they would not buy it. But crop insurance is not like other insurance markets, because farmers can get the Cadillac coverage without paying the Cadillac premiums.

Figure 3 shows the premium subsidy dollars available for the three types of crop insurance. Because the subsidies are proportional to the coverage amounts, RP subsidies are 80 percent higher per acre than RP-HPE's and 90 percent higher than YP's. Figure 3 shows clearly that farmers who want to maximize their subsidies can do so by buying 85 percent RP coverage – a choice that substantially increases the cost to taxpayers. Most farmers, however, make more sophisticated calculations than just maximizing the subsidies.

Suppose that premium subsidies were equalized on a dollar-per-acre basis across all products and coverage levels. Farmers considering higher coverage levels would compare the incremental cost to the additional benefit. Similarly, farmers considering whether to move from RP-HPE to RP would compare the incremental cost of RP with its additional benefits. The incremental cost of choosing a higher coverage level or RP is reflected in the difference in premiums shown in Figure 2. As with any other insurance, the incremental benefit of the additional coverage depends on a farmer's ability and willingness to absorb risk. When the incremental benefits of higher coverage or RP are greater than additional costs, farmers will choose the more expensive insurance.

Figure 2. 2012 Per-Acre Crop Insurance Premiums for a Champaign County Corn Farmer



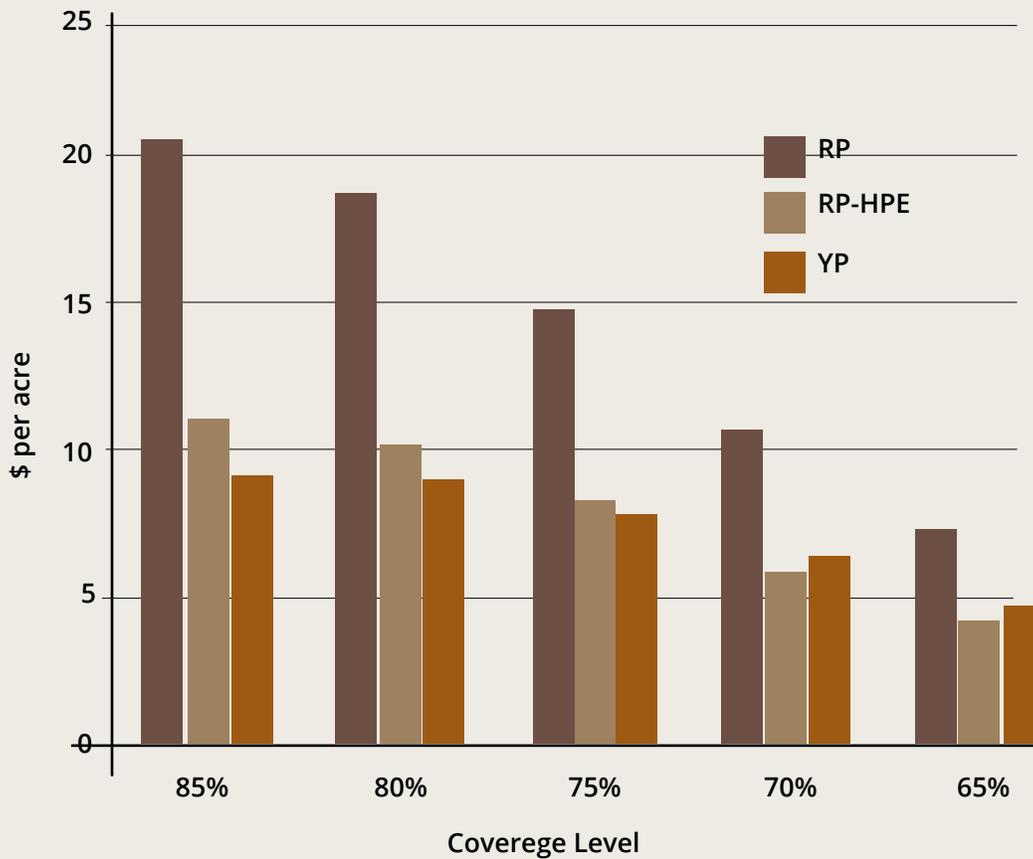
Source: Calculated from premium calculator located on USDA's Risk Management Agency's website.

But as shown in Figure 3, premium subsidies are *not* equal. Farmers who buy RP and high coverage levels benefit from higher premium subsidies. Farmers considering higher coverage levels or RP do not have to pay the full incremental costs. And that means that many more will find that the benefits of higher coverage levels and RP exceed their subsidized cost. Whether farmers decide to increase coverage or buy RP because of premium subsidies depends on how much of the incremental cost they are asked to pay. If they don't have to pay any of the incremental cost, they will all find the additional insurance attractive. If they have to pay 100 percent of the incremental cost, on the other hand, premium subsidies don't influence their choices.

Figure 4 shows the proportion of incremental cost that the Champaign County corn farmer must pay for higher coverage levels for all three types of insurance. The farmer pays only 40 percent of the additional cost of moving from 65 percent to 70 percent coverage. The costs are so low that almost all would find that this move generates benefits that exceed their costs. In contrast, a smaller proportion of farmers would find that moving from 80 percent to 85 percent coverage generates sufficient benefits to make it worthwhile because they have to pay 88 percent of the incremental cost.

The actual coverage levels chosen by Champaign County corn farmers are shown in Figure 5. Almost 89

Figure 3. 2012 Per-Acre Premium Subsidies for a Champaign County Corn Farmer



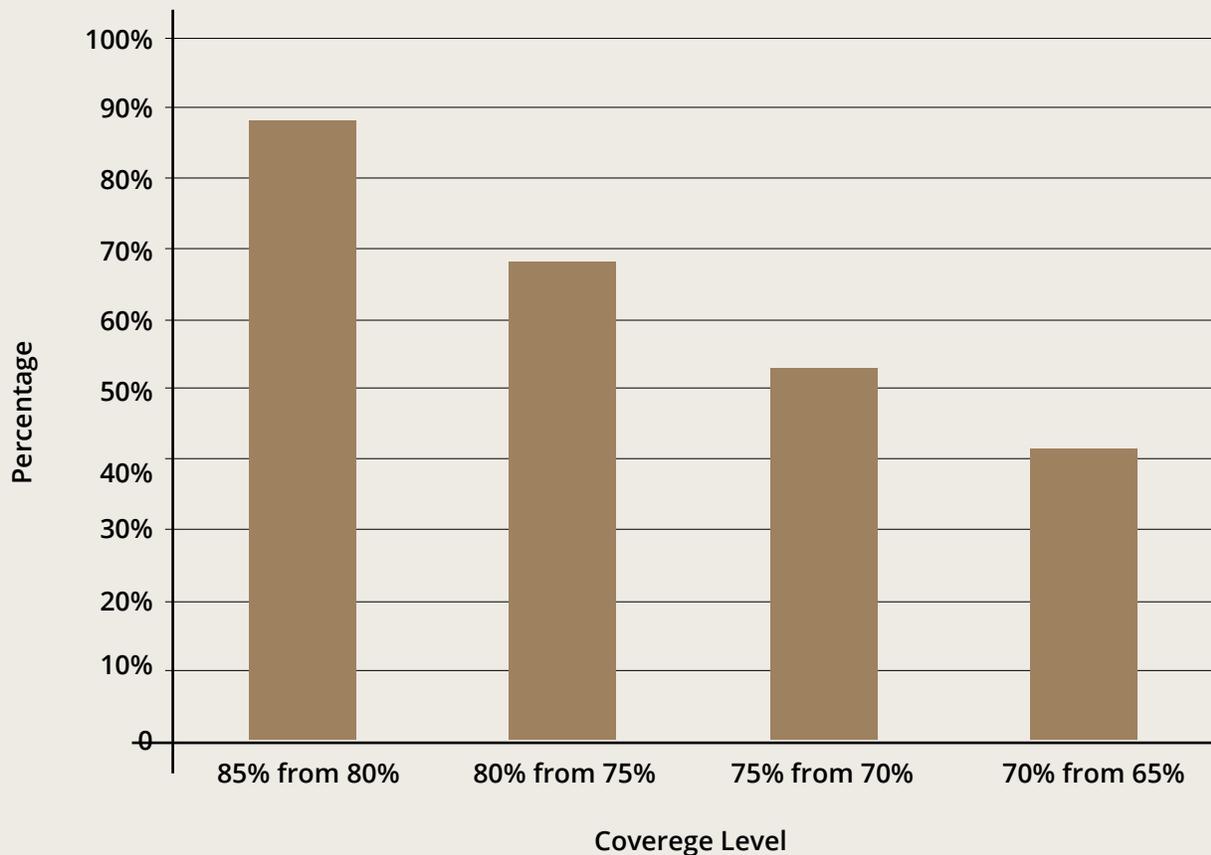
Source: Calculated from premium calculator located on USDA’s Risk Management Agency’s website.

percent calculated that the artificially low incremental benefits of moving to the 80 percent and 85 percent levels exceeded the incremental costs. That so many farmers found that the incremental benefits of 85 percent coverage to exceed the incremental costs is somewhat surprising, since they had to pay 88 percent of the additional costs. One explanation is that many farmers who bought 85 percent coverage insured their acreage under an enterprise unit that qualified them for even higher subsidies and lower incremental cost requirements than shown in Figure 4.

The same type of calculation can be made for the choice of insurance product. Figure 6 shows the proportion of incremental cost that the Champaign

County corn farmer must pay for moving to RP from either RP-HPE or YP at various coverage levels. Farmers are only asked to pay 41-to-62 percent of the cost of moving to RP at the same coverage level. For example, farmers insured at the 85 percent level pay 62 percent of the cost of moving up to RP. Farmers insured at the 80 percent level pay just over 50 percent of the cost of securing the Cadillac coverage. As a result, you’d expect that most farmers would find that the benefit exceeds the costs. And you would be correct. Only 11 percent of corn farmers in Champaign County who bought crop insurance chose to buy RP-HPE or YP. When you can get Cadillac coverage at a fraction of the actual cost, most opt to buy it.

Figure 4. Proportion of Incremental Cost of Higher Coverage Paid by Farmers



Source: Calculated from Figures 2 and 3.

Giving farmers incentives to buy RP policies and increase their coverage levels increases taxpayers' costs because the amount the program costs taxpayers is largely proportionate to the cost of subsidizing the premiums. An examination of program costs in 2012 demonstrates that when premiums go up, so too do program costs.

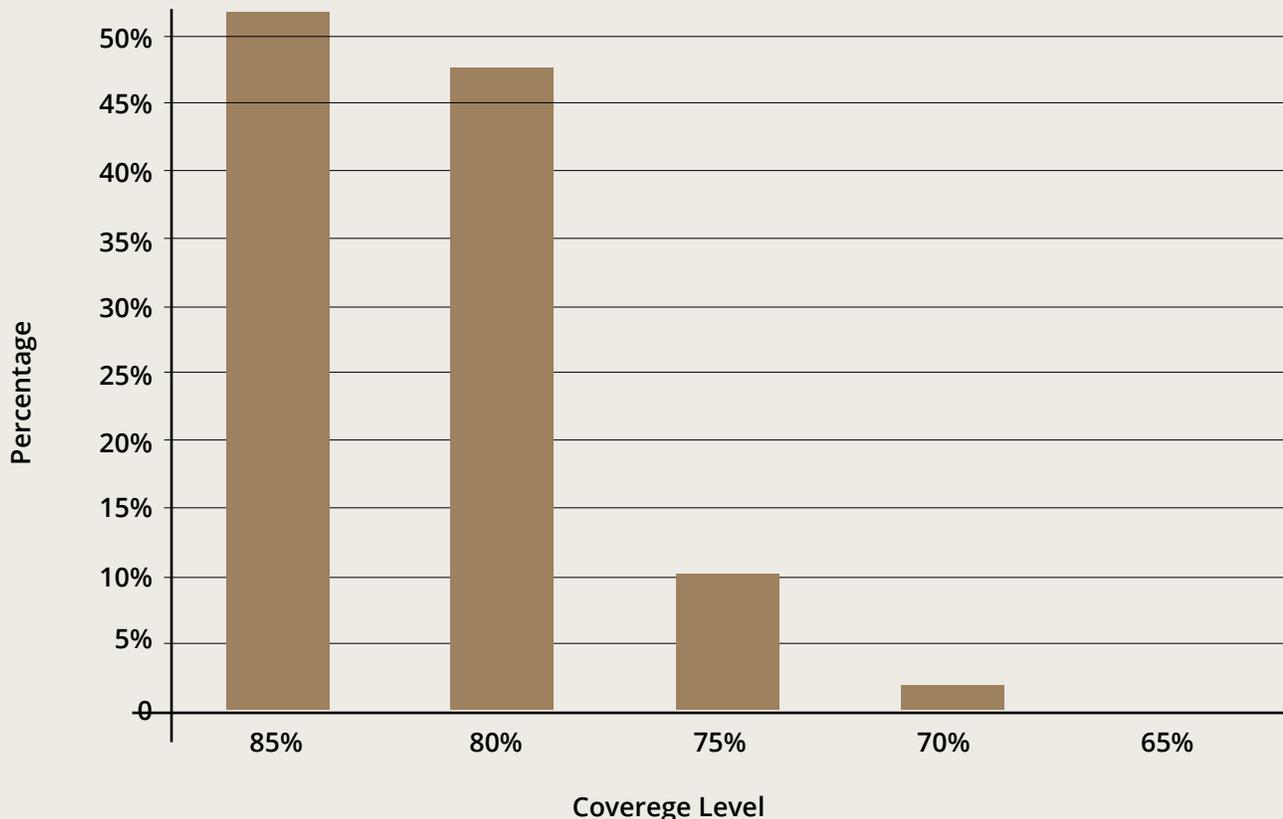
CROP INSURANCE PROGRAM COSTS

Table 1 summarizes program data that can be used to calculate how much the crop insurance program cost taxpayers in 2010, 2011 and 2012. Three years

of data are shown to illustrate how much these costs can vary from year to year.

Row 1 shows the total premium – the premium paid by farmers plus the premium paid by taxpayers. Row 2 is the total payout to farmers who made claims against their insurance. Gross underwriting gain (Row 3) is calculated by subtracting payouts (Row 2) from premium (Row 1). In both 2010 and 2011 there were gross underwriting gains, but in 2012 there was a large gross loss. Gross underwriting gains are shared between taxpayers and the crop insurance companies. The sharing rules for losses are complicated, but in general, the larger the loss (claims exceeding premiums), the greater the taxpayers' share.

Figure 5. Proportion of RP, YP and RP-HPE Acreage Insured at Various Coverage Levels in Champaign County, Ill.



Source: Summary of Business Reports. USDA-RMA.

Row 4 shows the premium subsidy. This is the amount of total premium paid by taxpayers, not farmers. The amount of the premium paid by farmers shown in Row 5 is calculated by subtracting the premium subsidy (Row 4) from total premium (Row 1). In 2012, farmers paid \$2.882 billion in premiums, while taxpayers paid \$4.126 billion.

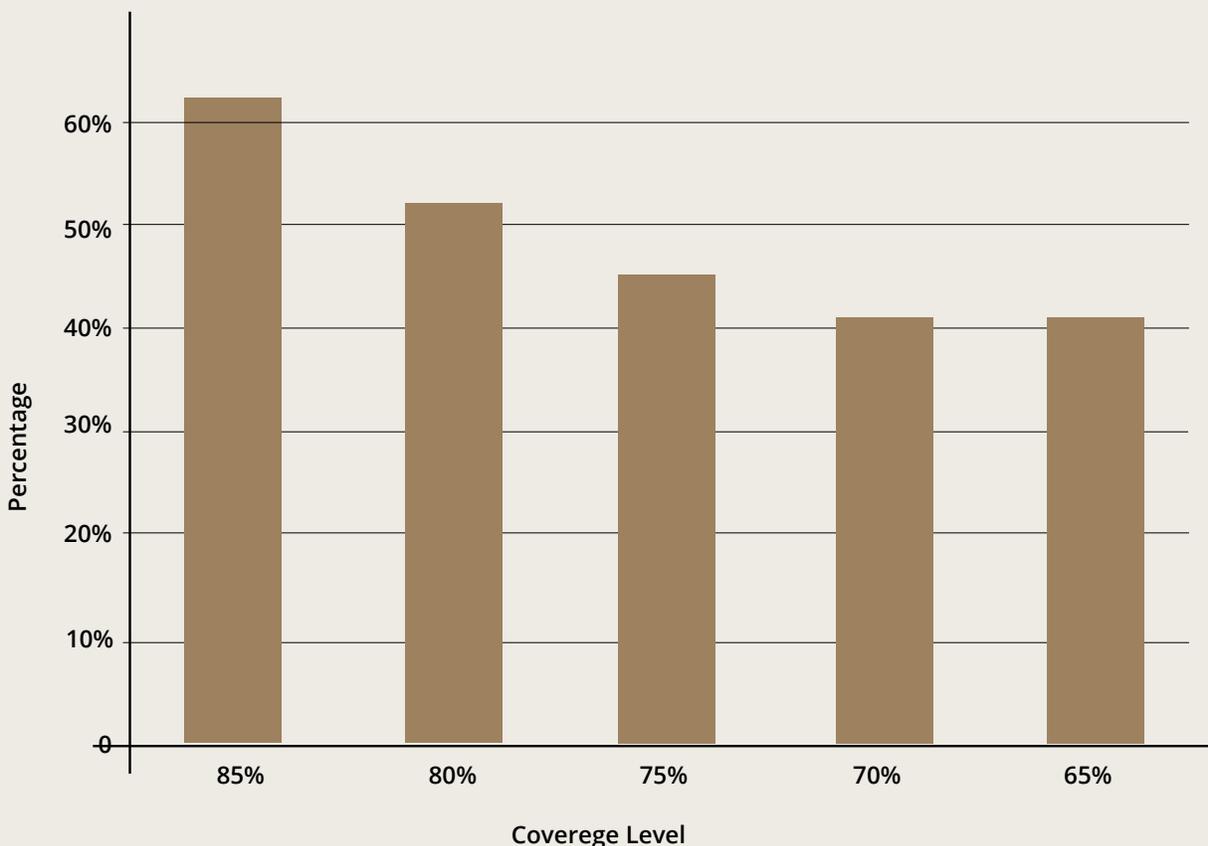
The net cash benefit farmers gained from the crop insurance program (Row 6) is found by subtracting the farmer-paid premium (Row 5) from the payouts to farmers (Row 2). In 2010, farmers netted \$1.37 billion. In 2012, farmers netted almost \$12 billion.

Payments to insurance companies for their

management and delivery (administrative and operating costs, or A&O) of the program in 2012 totaled \$1.4 billion (Row 7). Row 8 shows the companies' underwriting gain. In 2012 this gain was negative, meaning crop insurance companies lost \$1.3 billion. Taxpayers lost more than twice as much, \$3.7 billion (Row 9). The net cash paid to companies in 2012 was \$105 million (Row 7 plus Row 8). The net cost to taxpayers was \$12.1 billion (Row 11), calculated by adding the net cash paid to farmers to the net cash paid to insurance companies.

Table 1 shows some of the peculiarities of the crop insurance program. First, note that in 2010, taxpayers paid insurance companies more than farmers

Figure 6. Proportion of Incremental Cost Paid by Farmers Moving to RP from either RP-HPE or YP



Source: Calculated.

received in net payouts. In fact, taxpayers paid companies more than farmers in six of the last 12 years. This illustrates both the high cost of delivering the program and the large year-to-year swings in payouts. These are a direct result of so much of the program being concentrated on corn and soybeans. When those two crops do well, the program's costs are dominated by payments to the companies.

Second, when there are underwriting gains, insurance companies benefit more than taxpayers. In 2010, 57 percent of the gross underwriting gain went to the companies. Taxpayers got 43 percent. In 2011, companies gained \$1.7 billion while taxpayers lost \$550 million, even though the program has a whole had a gain of \$1.1 billion.

In 2012, taxpayers will absorb almost 75 percent of the gross underwriting loss. This is because the complicated formula for sharing gross underwriting gains ensures that taxpayers send lots of money to companies when losses are small and greatly limits the loss to companies when overall losses are high. Since 2001, taxpayers have paid companies significant underwriting gains in every year except 2002 and 2012. Over the 12 years, companies have enjoyed \$10.3 billion in underwriting gains at taxpayers' expense. Taxpayers have suffered a net loss of \$276 million over the same period.

The structure of the crop insurance program ensures that taxpayer costs are largely proportionate to the total premium paid by farmers and taxpayers. The

Table 1. Crop Insurance Program Costs

Row #		Crop Year		
		2010	2011	2012
		\$ millions		
1	Total Premiums ^a	7,593	11,968	11,083
2	Payouts ^a	4,250	10,855	16,089
3	Gross Underwriting Gains ^b	3,343	1,113	-5,006
4	Premium Subsidies ^a	4,711	7,461	6,957
5	Farmer-Paid Premiums ^c	2,882	4,507	4,126
6	Net Cash to Farmers ^d	1,368	6,348	11,963
7	A&O Reimbursements ^e	1,371	1,383	1,411
8	Company Underwriting Gains ^f	1,915	1,666	-1,306
9	Government Underwriting Gains ^g	1,428	-553	-3,700
10	Cash to Companies ^h	3,286	3,049	105
11	Taxpayer Cost ⁱ	4,654	9,397	12,068

a National Summary of Business Reports, USDA- RMA as of April 1, 2013.

b Row 1 minus Row 2.

c Row 1 minus Row 4.

d Row 2 minus Row 5.

e Cost and outlay estimates <http://www.rma.usda.gov/aboutrma/budget/cycost2003-12.pdf>

f For 2010 and 2011, Reinsurance Reports, USDA-RMA. Calculated for 2012.

g Row 3 minus Row 8.

h Row 7 plus Row 8.

i Row 6 plus Row 9.

cost of premium subsidies increases as the total amount of premiums goes up, and the net cash paid to farmers goes up hand-in-hand with premium subsidies.

Average underwriting gains paid to companies are also proportionate to total premiums. And finally, administrative and operating reimbursements (A&O) also go up as premiums rise, although they have been

capped since the Standard Reinsurance Agreement was renegotiated in 2011 as long as total premiums don't fall below about \$8 billion.

Figure 7 illustrates the strong positive relationship between taxpayer costs and total premiums, which is the main reason taxpayers' costs for the crop insurance program have exploded.

Premiums have risen for two reasons. The first is that high prices have made crops more valuable, making them more expensive to insure. The second is that the powerful incentives farmers have to buy higher levels of the far more expensive RP policies. To understand the magnitude of these effects and the resulting escalation in costs, it is useful to calculate what the program would have cost in 2012 if farmers who bought RP policies had instead purchased YP or RP-HPE.

2012 PAYOUTS WITHOUT RP

Premiums for RP coverage are higher than for YP and RP-HPE because farmers have a higher chance of a payout and typical payouts are higher. If the harvest price is lower than the springtime price, then RP and RP-HPE payouts will be the same and both will be higher than YP payouts. If, however, the harvest price is higher than projected, payouts for RP coverage will be higher – sometimes far higher – than for YP. And YP payouts in turn will be higher than for RP-HPE .

The drought year of 2012 provides a good case study to understand why payouts from RP are so much higher than from YP or RP-HPE when disaster strikes. When farmers locked in their insurance yield or revenue guarantees for 2012, projected prices were \$5.68 per bushel for corn and \$12.55 per bushel for soybeans. As it turned out, the actual prices at harvest were \$7.50 and \$15.39 per bushel as the drought lowered yields and drove up crop prices. A straightforward calculation shows how much lower payouts would have been if every corn and soybean farmer had purchased a YP policy instead of an RP policy at the same coverage level. When the harvest price is higher than the projected price, RP policies pay for any yield loss at the higher value, while a YP policy would pay out at the lower projected price. The percent difference between an RP and a YP payout is equal to the ratio of the projected price to the harvest price.

Without knowing each farmer's actual yield, it isn't possible to determine exactly what payouts would

have been if every farmer who purchased an RP policy had instead purchased RP-HPE. However, it's possible to estimate the payouts by using the actual per-acre payouts for RP-HPE at each coverage level for each state and making the assumption that the per-acre payouts would have remained constant if all RP policies been RP-HPE instead. It's a simple matter of multiplying the per-acre payouts by the number of acres insured under RP at each coverage level..

Table 2 shows the results for corn and soybeans, which accounted for almost 80 percent of all payouts for insured crops in 2012.

In reality, more than 94 percent of corn and soybean payouts in 2012 resulted from crop losses covered by RP policies. If they had been YP policies instead, payouts would have been cut by 22 percent, from \$12.7 billion to \$9.9 billion. Because RP values crop losses at the higher of the harvest price or the projected price, payouts were \$2.8 billion higher.

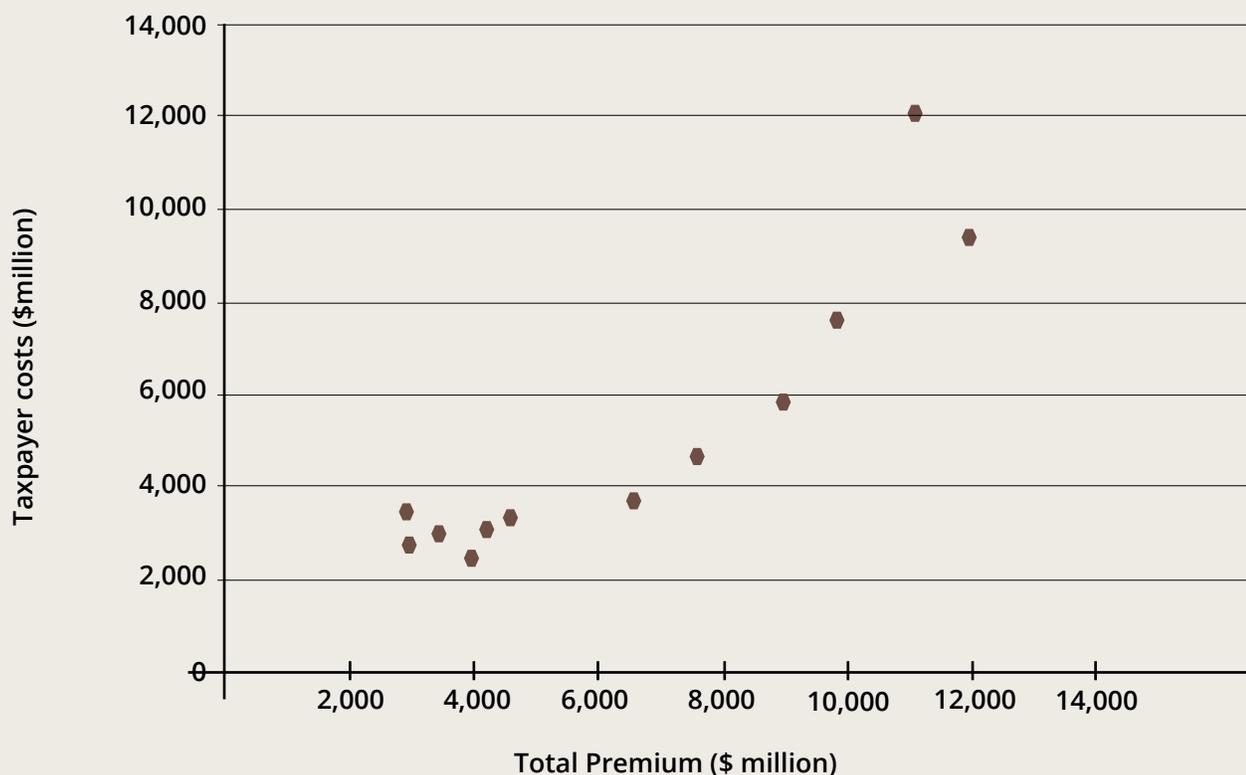
With RP-HPE policies, the cost to taxpayers would have been even less. Corn and soybean payouts would have been cut by more than half to just over \$6 billion. This calculation shows the importance of a proper definition of what constitutes a loss. If the effects of drought-induced higher prices are appropriately accounted for, the impact of the drought is substantially smaller than if the higher prices are ignored. RP-HPE policies effectively account for drought-induced higher prices. RP policies do not.

WHAT CONSTITUTES AN ADEQUATE SAFETY NET?

It is clear that current premium subsidies give farmers incentives to buy RP policies, greatly increasing the program's costs. The two questions policymakers should ask are:

1. Given the limits on agriculture subsidy dollars, does it make sense to spend them on RP coverage?

Figure 7. Crop Insurance Program Costs and Total Premiums Since 2001



Source: Calculated by author.

2. Would farmers have an adequate safety net if they purchased YP or RP-HPE policies? It would be easy to answer this question if we knew what kind of safety net farmers would purchase if taxpayers were not subsidizing some of their choices. Unfortunately, there's no way to know how farmers would spend their own money if their decisions were not heavily influenced by subsidies. A useful alternative, however, is to examine the different degrees of "safety" provided by the main three insurance products.

Return now to the corn farmer with an expected yield of 200 bushels per acre. Suppose that before planting corn in 2012, this farmer anticipated getting

a price of \$5.68 per bushel and a yield of 200 bushels. That is, this farmer expected revenues of \$1,136 per acre ($\5.68×200 bushels). Suppose further that this farmer purchased crop insurance at the 85 percent coverage level. At this level RP and RP-HPE provide an insurance guarantee of \$965.60 per acre. Under YP the guarantee is set at 170 bushels per acre. Below this yield level the lost bushels would be valued at \$5.68 each. Table 3 shows payouts, market revenues and total revenues for this farmer if his 2012 yield was 0, 50, 100 or 150 bushels per acre, assuming that the farmer sells the corn at the 2012 official harvest price of \$7.50 per bushel.

Because the harvest price of \$7.50 per bushel was

Table 2. Impact of RP on 2012 Corn and Soybean Payouts (\$ million)

Actual Payouts	Corn	Soybean	Total
RP	\$10,064	\$1,899	\$11,962
YP	\$378	\$105	\$328
RP-HPE	\$223	\$20	\$398
Total	\$10,665	\$2,024	\$12,688
Payouts if YP replaced RP			
YP	\$8,000	\$1,631	\$9,631
RP-HPE	\$223	\$20	\$243
Total	\$8,223	\$1,651	\$9,874
Payouts if RP-HPE replaced RP			
YP	\$378	\$105	\$483
RP-HPE	\$4,775	\$764	\$5,539
Total	\$5,153	\$869	\$6,022

Source: Summary of business reports, USDA-RMA and author calculations.

higher than the projected price of \$5.68, RP payouts are higher than YP and RP-HPE payouts at all three yield levels. YP payouts occur whenever RP payouts occur but are lower because YP policies pay out at the lower projected price. There is no RP-HPE payout when yield is 150 bushels per acre because revenue from selling the smaller crop at the drought-induced higher price is above the guaranteed level.

Total revenue equals the market revenue plus the insurance payout. RP total revenue is constant at \$1,275 per acre because the RP payout compensates for lost bushels at the same price that the farmer sells harvested bushels. Note that total revenue under RP is \$139 per acre higher than anticipated revenue. This shows that when prices increase and there is a yield loss, farmers who buy RP actually net more revenue than if there had been no drought.

The same situation can occur with YP coverage if the yield loss is not too great, but with YP the reason why total revenue is higher than anticipated revenue is that harvested bushels are sold at a higher price. When yield is low enough, total revenue will fall below anticipated revenue, but it will never fall below the insurance guarantee of \$965.60.²

Because RP-HPE provides pure revenue insurance, the farmer can never collect an insurance payout that produces more revenue than the insurance guarantee. If total revenues rise above the guaranteed level, it is because the farmer has benefited from the drought-induced higher prices, which offset part or all of any loss from lower yields.

Supporters of the crop insurance industry claim that the 2012 Corn Belt drought was devastating to farmers.³ But Tables 2 and 3 show that how

Table 3. Outcomes after Insurance Payments for a Drought-Stricken Corn Farmer

	Harvested Yield (bu/acre)			
	0	50	100	150
Market Revenue (\$/acre)	\$0	\$375.00	\$750.00	\$1,125.00
Payout (\$/acre)				
RP	\$1,275.00	\$900.00	\$525.00	\$150.00
RP-HPE	\$965.60	\$590.60	\$215.60	\$0.00
YP	\$965.60	\$681.60	\$397.60	\$113.60
Total Revenue				
RP	\$1,275.00	\$1,275.00	\$1,275.00	\$1,275.00
RP-HPE	\$965.60	\$965.60	\$965.60	\$1,125.00
YP	\$965.60	\$1,056.60	\$1,147.60	\$1,238.60

Source: Calculated.

devastating the drought was depends on your definition of devastation. Given the high proportion of acres insured in 2012, the size of the payouts is one measure of devastation. Actual payouts to corn and soybean farmers totaled \$12.7 billion. When crop insurance contracts were signed before planting time in 2012, corn and soybean farmers expected to earn a total of \$116 billion in market revenue. Insurance payouts, then, will account for about 11 percent of total anticipated revenues. But RP policies accounted for almost all of these payouts, and RP payouts overstate actual economic losses because they do not account for the higher revenues farmers captured because of drought-induced higher prices.

Table 1 provides a better measure of the degree of devastation. Payouts would have been just over \$6 billion if farmers who bought RP coverage had instead bought RP-HPE policies – less than half of the actual payouts. As shown in Table 3, farmers with RP-HPE coverage would have had a solid floor under their revenues. By the RP-HPE measure of

devastation, losses due to the drought amounted to about 5 percent of anticipated revenues.

The point is not to argue that the drought did not seriously affect crop yields. Clearly it did. But given the high cost of the crop insurance program, it is reasonable to ask whether it makes any sense to entice farmers to buy Cadillac coverage with taxpayer dollars when a basic revenue guarantee is possible at much lower cost.

It is no mystery why farmers want to buy RP coverage: it is more heavily subsidized and it pays out more, hence farm profits are higher. There is only one possible risk management benefit for farmers who buy RP. Farmers who forward sell their crop face the risk that they will not have enough yield to deliver on the contract. If the price of the contracted commodity rises, producers with a short crop will lose money because they must purchase more expensive grain to honor their contract. Farmers who forward contract the exact same proportion of their crop that they insure with RP will find that the additional payout

under RP compensates them exactly for this hedging loss. Thus purchasing RP lowers the risk to farmers of forward selling their crop.

Given the pressure to cut funding for all agricultural programs, it is a stretch to argue that every dollar currently being used to encourage farmers to buy RP and high coverage levels is needed, when the only possible risk management benefit is to reduce some farmers' hedging risks. If farmers had to pay the full incremental costs of RP, only those who highly value the additional hedging risk protection would buy it. The rest would opt for RP-HPE or YP. This would dramatically lower the cost of the crop insurance program while still providing a generous safety net.

The considerable savings could be shared between deficit reduction and other programs in which both taxpayers and farmers have a fundamental stake in the outcome, such as conservation and research. Making farmers pay a larger share of the incremental cost of Cadillac insurance coverage would be a good place to start.

NOTES

1. The premiums shown in Figure 2 are designed to be actuarially fair in that they would generate enough revenue to pay out expected indemnities over time.
2. If the harvest price is lower than the projected price, then total revenue for the farmer who buys YP can fall below the insurance guarantee if yield is positive because harvested bushels will be sold at a price that is less than the price at which any yield loss is valued.
3. See, for example, Tom Zacharias, "Farmers Rely on Crop Insurance when Nature Turns Against Them." *The Hill*, March 1, 2013.