

Good afternoon everyone and welcome to our webinar, **Conservation Compliance: How Farmer Incentives are Changing in the Crop Insurance Era.**

My name is Kellie Mendonca and I will be your host. Our speaker today is Roger Claassen. Roger Claassen is a senior agricultural economist with the USDA Economic Research Service. Roger's research has included work on the wetland policy issues, cost-effective design of voluntary conservation programs, and agricultural conservation programs. His current research includes work on conservation compliance incentives after the 2014 Farm Act, the role of crop insurance and farm income support in agricultural land use decisions, transaction costs in conservation programs, and no-till adoption. Roger holds a PhD in Agricultural and Resource Economics from the University of Maryland and a BS in Agronomy from Kansas State University.

During today's webinar, if you have a question, please type it in at any time using the chat feature located at the bottom left-hand corner of your screen and Roger will address it during our questions and answers after the presentation.

Well, I think we're ready to start so, Roger, you may begin.

Thank you, Kellie, and thank all of you for joining us this afternoon. Good afternoon to everyone! I'm going to give you a short overview of what we found in our research on conservation compliance. In addition to the full report available on our website, there's also an Amber Waves feature article. Amber Waves is our in-house magazine, so there's a short, plain English written summary of that, and I'll tell you how to access both of those things at the end of the presentation.

So to start off, a little bit of background on conservation compliance: Compliance ties farm program benefits to certain conservation actions. This was initially part of the 1985 Farm Act, the Food Security Act of 1985. One part is highly-erodible land conservation which requires that farmers have approved soil conservation systems on highly erodible fields; the other part of it is wetland conservation which says farmers need to refrain from draining any wetlands that might be located on their farms.

Producers who violate those requirements risk becoming ineligible for a really wide range of agricultural-related programs and benefits. Almost all of the money falls under four basic categories: commodity programs; disaster assistance; crop insurance premium subsidies; and conservation payments. And because farmers risk losing all of their payments they become ineligible for these programs that they violate compliance even on a part of their farm, the farm-wide value of these payments is really the incentive to comply here, or what we're going to refer to frequently this afternoon as the Compliance Incentive.

So a couple of research questions: First question is, how much soil erosion reduction can we really attribute to highly-erodible land compliance? And this is an interesting question because we saw really broad-based reductions in soil erosion, not just on highly-erodible land, but also on lands clearly not subject to highly-erodible land compliance. We saw that in the media in the immediate aftermath or during the implementation of highly-erodible compliance, and I'll talk more about that in a little bit.

Second question is sort of on, how did the 2014 Act change incentives for meeting compliance requirements? The 2014 Act made a lot of changes to programs that underlie compliance. The programs that farmers can lose access to if they violate compliance before sort of biggest ones that I've picked out. Here is it ended direct payments. That was about a five-billion-dollar a year program, so ending that

reduced compliance incentives. It also ended crop disaster assistance--the supplemental revenue insurance program what would have been called SURE under the 2008 Act. Ad-hoc disaster assistance is still possible, but Congress hasn't passed any for a while, so we're assuming that that's off the table.

There are new shallow loss programs. The 2014 Act added things like the Agricultural Revenue, the ARC program, Avenue Agricultural Revenue coverage, and some other programs of what we're calling Shallow Loss programs, and it relinked crop insurance premium subsidies to compliance crop insurance. Premium subsidies were subject to compliance of the 85 Act. They were removed in 1996.

Crop insurance wasn't a very big program. Then it was felt that if the link was severed to compliance, people might buy more crop insurance. What subsequently happened was that Congress raised the premium subsidy significantly and farmers increased participation significantly, so now we have about 80 percent of the major crops covered by crop insurance, and the Federal government pays about 60 percent or a little bit more of the premiums. That was a little bit more than six billion dollars in 2017.

So what about soil erosion and compliance? So in this graph, this is soil erosion on cultivated crop land from '82 to 2012. Each one of the years here--'80 to '87, '92 is a national resources inventory survey year. The National Resources Inventory, or NRI, is a land-based data set where they collect a lot of information on land use, soil erosion, wetlands, and many other things on literally hundreds of thousands of points of land throughout the U.S.

The height of the bars in this graph is soil erosion and billions of tonnes per year. The dark part is dew, water or rainfall; the light part is wind erosion, and if you compare the 1982 and 1997 bars that brackets the highly-erodible land conservation implementation period, and we see between those two bars we got about a 40 percent reduction in soil erosion on cultivated cropland--a really huge reduction. We know that we can't necessarily attribute all of that to the highly-erodible concert land conservation.

As I said earlier, some erosion reduction happened on land that isn't subject to HDL-C land that was enrolled in the CRP. There are other reasons why erosion reduction happened, so to really get into this question of how much erosion reduction can we assign to HDL-C? We compared erosion reduction on land that's clearly subject to highly-erodible land compliance, to the reductions on land that's similar but is not subject to highly-erodible land compliance. Again our data here is from national resources inventory, or most of our data in that survey in that 2012 we found 83 million acres of cultivated cropland that met the definition of highly-erodible land. However, a field is subject to highly-erodible land conservation only if it's at least one-third of the area, or at least 50 acres within the field are highly-erodible soil, so that 83 million acres breaks down into 60 million acres of highly-erodible land. That's actually in a field; is subject to highly-erodible land conservation; 23 million acres of highly-erodible land are not subject to highly-erodible land conservation so, using a statistical model and controlling for a number of other characteristics (farm size, evidence of farm program benefits, etc.) we developed a model.

These are our results in terms of water erosion, or sheet and real erosion. Again, across the bottom, you'll see the NRI survey years '82 - '87. The height of the bar is predicted soil erosion. This is predictions from our model, again in tonnes per acre, per year. This is the average predicted erosion on these types of land. The blue bar is for that highly-erodible land that's inside a highly-erodible field that's subject to highly-erodible land conservation. The red bar is for highly-erodible land that isn't subject to highly-erodible land conservation. And if you compare the 1982 and '97 bars, you'll see that we got a

bigger reduction on land that's subject to highly-erodible land conservation: 6.6 tonnes per acre per year reduction on average on land that's subject to compliance; only a 3.9 ton per acre per year reduction on average from land that isn't subject to compliance. But it's still highly erodible, so that's a difference of 2.7 tons per acre per year. That is a statistically significant difference, so some pretty strong evidence here that conservation compliance did make a difference.

This is the same graph but for wind erosion for land; it's highly erodible for wind. I should say in this case the results are not as strong on land that is subject to compliance. We got a 3.2 ton per acre per year reduction in soil erosion on average. On highly erodible lands that's not subject to compliance we saw only about a 2.3 ton per acre per year reduction on average. The difference there is about nine tenths of a tonne per acre per year, and that's not significantly different from zero, so somewhat weaker evidence on land that's highly erodible for wind.

I'm going to switch now to talking about the 2014 Farm Act and incentives compliance incentives under the 2014 Act, and before I do that I'm just going to spend a little bit of time explaining what the metric is that we use to measure the strength of compliance incentives. The ideal measure, the ideal metric that we'd like to have to measure the incentives for producers to comply, would be a farm level ratio of compliance benefits to compliance costs. If that ratio is, more than one farmer would have ample incentive to comply, their benefits would be lower than their costs. If it's less than one, the opposite is true. The benefits to the farmer are what we've already talked about. All these different categories of payments you can see on the screen: We have good farm level data on all of those that we've used.

In this study we've used data for more than 200,000 farms, so it's a very detailed effort in terms of the benefits on the cost side. The costs are the cost of maintaining those soil conservation systems on highly-erodible land, or profit forgone on land that you might have farmed, except for compliance land that you might have drained and farmed, or highly-erodible land that you might have cropped, except that there was a compliance requirement. There's no farm-level data available on cost so, rather than give up at this point, we adopted a proxy measure which is a farm level ratio of compliance benefits to potential return to cropland that is subject to highly-erodible land compliance or wetland compliance. Cropland return is used in the denominator here because it's an upper bound or maximum level of compliance cost for land that is highly erodible and has been cropped for a long time.

There was a decision made in the implementation to say that compliance costs would be limited to what a farmer could afford and continue to crop land, so the client's cost can exceed the return to land in crop production. In fact, most times they're a lot less for land that is already in crop production. That value of land for crop production is what you would get if you converted. Plus you have some drainage costs or other conversion costs. You have some opportunity costs for another land use if we were using the land for, say grazing or something like that. We proxy cropland return with the cropland rental rate, so essentially our metric is compliance benefits to the cropland rental rate in the local area wherever the farm is located.

So here we're going to start into our basic results in this graph. Let me just take a minute to explain what's going on here. The orange bar is for the 2014 Farm Act. The blue bar is compliance incentive under the 2008 Act. The height of the bar represents cropland in highly-erodible fields in millions of acres. And then across the bottom are the compliance incentive ranges so clear on the right side where it says greater than 1. Those are farms where the total amount of farm program benefit they receive

exceeds the annual rental returns, or the rental value of land that's either subject to highly-erodible land conservation effect, in this case just subject to highly erodible land conservation.

If you look clear on the left side, we've got about 9 million acres of highly erodible lands that are on farms that have zero payments. You don't get anything from the government, so they have no incentive to comply. The next set of bars you're at a point to, those are farms that have farm program benefits that are from zero to 20 percent of the value of the annual rental value that highly-erodible land on the farm. So as you move right, the compliance and sentence gets stronger. We have about 25 million acres that clearly has enough compliance incentive, and the greater than one category. If you look at the point two zero, two point two, and two point four categories, there's about twenty-seven million acres in those two categories, so quite a bit of land down there as well. Overall very little change in aggregate, at least between the 2008 and the 2014 Farm Acts, incentives look pretty similar.

This graph depicts what would happen if you took crop insurance premium subsidies, separated them from compliance in the 2014 Act, leaving everything else the same about the 2014 Act, so that orange bar-- that's the same orange bar that we've been looking at that we saw on the last slide--the grey bar is the number of acres in each one of these incentive categories if we no longer make crop insurance premium subjects subsidies subject to compliance. So on the high compliance and on the strong compliance and the greater than one, it drops from about twenty-five million to about fourteen-million acres. If you look on the other end, the zero two point two category, the acreage, there it more than doubles-- it goes from about twelve to twenty-seven million or something like that, so a big change. A lot of farms with smaller compliance incentives. If we severed the tie between crop insurance premium subsidies and compliance, compliance incentives are sensitive to crop crisis.

Again, if you look at that orange bar, the one in the middle here--that's the same orange bar we've seen in the last two slides--this is what we call our medium price scenario. It's based on crop prices that were prevailing in 2010. They're pretty similar to what crop prices are today. If you look, for example, the crop insurance base price for corn in 2010 was three dollars and 99 cents a bushel for 2017. The crop insurance base price for corn is three dollars and ninety six cents a bushel. There's more difference for other commodities. Some are higher, some are lower, but we're in the same range now as we were in 2010.

Now if you look at the darker bars, those represent higher prices. We drew those from the 2013 crop year. They are among the highest prices we've seen since 2004. Most commodities we get pretty much the similar compliance incentives then as we did under the medium price scenario. If you look at the light colored bars, that's the low price scenario. We used crop prices from 2004. In that case, those are among the lowest prices we've seen since 2000. Compliance incentives are much higher in this situation, and the reason they're much higher is that commodity programs and commodity payments are triggered either by low prices or by low revenue so when you have a low price you're just more likely to see those kind of payments happening.

Now one of the things we found because we did a farm level analysis of this rather than a more aggregate analysis of this, it said even though the incentives look about the same between in the 2008 Act and the 2014 Act, when you look at it in aggregate, when you look at a farm level, you see a lot of changes, so the graph on the left here, the height of the bars, is cultivated cropland and highly-erodible fields. Again, million acres on the bottom. We've got the percent change in compliance incentives on the farm at the farm level between the 2008 and 2014 Acts. And so if you go to the right of center on the

graph, those are farms that have larger incentives under the 2014 Act than they had under the 2008 Act. And again we're looking at the median price scenario. Here there's about 30 million acres on those farms that have larger incentives. There are about 44 million acres on farms that have smaller incentives, and some of them have, you know smaller incentives. There's a lot of farms, a lot of acres on farms, I should say that have 25 percent or more reduction in compliance incentives again in that medium price scenario. A lot of farms that even have a 50...even a few that have as much as a 75 percent reduction.

If you look at the map here on the right, it sort of helps tell the story about why this is happening. The dark red areas--those are areas where in that County, on average, they had more than a 25 percent decline in compliance incentives. Again, in the median price scenario, the dark green counties are places where on average in those counties they had a 25 percent increase or more in compliance incentives. So if you look at some of the dark red areas, one of the dark red areas is northern Illinois. This is a place where crop yields are high, and they're not very variable. They're consistent over time. The high yields mean high direct payments under the 2008 Act. The fact that yields aren't very risky--there isn't much risk yield, risk in this area, means that crop insurance premiums are relatively low. So when you took the direct payments out and added back the crop insurance premium subsidies on net, farmers in that part of Illinois saw they're in compliance--incentives decline. The opposite is true in the northern plains in the Dakotas. There's a lot of counties where we saw a 25 percent or more increase, and that's simply because their crop insurance premiums are high, and the premium subsidies are high, and their yields are lower by comparison.

Finally, this gives you another look of what would happen if we withdrew crop insurance premium subsidies from compliance in the current farm bill. The blue bars in this page are exactly the same blue bars as we saw in the last slide. The green bars are how compliance incentives would have changed if we pass the 2014 farm bill as it is, but hadn't included crop insurance premium subsidies as part of the compliance incentive. You just see a lot more highly-erodible land on farms that had reductions in compliance incentives, sometimes big reductions in compliance incentives. Because we don't have good measures of compliance costs at the farm level, it's really difficult for us to say how much difference this would make in farmer's decisions to actually comply. But if you look at the green bars, there's pretty big reductions in the overall compliance incentives on a lot of farms.

So finally I want to finish up just by talking a little bit about wetland conservation incentives. We had some data limitations that restricted our analysis to the Prairie-Pothole States. Those are the states in dark blue on that map, and to do this we had to think about a little bit about what kind of wetland is, or what kind of land is potentially convertible to wetland. And to do that we picked several categories of land. First of all, cropped wetlands. In the United States there are several million acres of land that are wet enough to be called wetland, but they're drying up. In some years it's dry enough at least to grow a crop. In some years you'd have a lower yield because it's a wet spot in the field. Some years you wouldn't get a crop at all on those kinds of wetlands, so the prime candidates for drainage. We also looked at some non-cropped wetlands. We looked at wetlands with seasonal hydrology--in other words, they're not wet all year around--and we thought those would probably be easier to drain. We also looked at land that had topography and productivity that's quite similar to existing cropland. We're not saying that these are the only wetlands that would ever be drained. We're not saying that if well and conservation ended tomorrow that these would automatically be drained, but it is a set of land that has some potential as cropland, given the kinds of land that we see used for crop production already.

This is similar to the graph that I showed earlier for highly erodible land conservation. Again, the blue bar is 2008 the orange bar is 2014 Farm Bill and the gray is 2014. Without the crop insurance subsidy, being subject to compliance--really what jumps out here--is on the right side. Those farms that have farm program benefits that are greater than the value of the land, subject to compliance, they control about 75percent of this potentially convertible wetland, about two and a half million acres of it. There's about three hundred seventy five thousand acres on farms that don't get any payments that would be subject to compliance, and about 15 percent go to the group in between into zero to one range. Basically the incentives for wetland compliance, at least in this part of the country, are pretty strong and they're not nearly as sensitive to the removal of the crop insurance premium subsidies, and they're not nearly as sensitive to price as the highly erodible land compliance incentives. I haven't shown that here, but it's in the report if you want to take a look there.

So finally, conclusions: There is some evidence to suggest that the highly-erodible land conservation incentives are similar under the 2008 and 2014 Acts, but the reality is that compliance incentives really vary widely across farms. The National results mask some pretty large changes at the farm level, and for many farms you know compliance incentives are probably going to be lower under the 2014 Act under this policy than they were under the 2008 Act. In the policies that were implemented under that Act, crop insurance is really important, particularly in highly-erodible land conservation. If we re-sever the link to crop insurance premium subsidies with compliance we're just going to have lower incentives on a lot of farms, and of course again the wetland compliance incentives for most of the Prairie Pothole Region are pretty strong. About 75 percent of that land seems well-protected with that.

I'm done. Here are links to our full report to our Amber Waves article, and my contact information, in case your question doesn't get answered today or you think of a question in the future. So thank you very much.

(Kellie) Thank you, Roger. We have a couple of questions for you. I've got a question from Marva and I think this is referring to either slide 9 or 10. Does that total cropland acreage include non-tillable acres such as orchards and vineyards?

(Roger) I don't believe it does. I believe it only includes cultivated cropland. There are two categories of cropland: there's cultivated and non-cultivated cropland, and here it's just cultivated cropland.

(Kellie) All right we have a question about water and wind erosion. Is there any way to measure the removal of shelterbelts, and how does that affect erosion rates?

(Roger) Oh, that's a great question. The NRI data really doesn't give us any information on the removal of shelterbelts. In fact, I don't know of any data. You know, possibly, if you have the right satellite imagery, you could see when you know shelterbelts were removed, certainly a lot of them have been removed throughout the plains in the last several decades. But you know this would be the wind erosion as measured by models employed by the Natural Resources Conservation Service. And you know I wouldn't have any idea on the extent to which they would actually consider whether there's a shelter belt or not. My guess is no, it's not in the data.

(Kellie) Okay, and here's another question. You noted that wetland conservation incentives are stronger overall than those for highly-erodible land conservation. Can you say more about why that's happening?

(Roger) Yeah, in the Prairie Pothole Region where we looked at wetland compliance incentives, what we

found was that the number of acres on individual farms that were subject to compliance—either highly-erodible land compliance or wetland compliance—was lower than the number of acres that are subject to compliance on those farms that are subject to highly-erodible land compliance. So if you look in some places where you know there are a lot of farms that have fairly low incentives for highly-erodible land compliance, a lot of those farms have 75 or 80 percent highly-erodible land in the Northern Plains. In the Prairie Pothole Region where we looked at, well in compliance, maybe on most of those farms there may be 60 percent of the land is subject to some kind of compliance requirement. So it's simply that the costs are lower on those farms in that region. For whatever reason, the amount of land and therefore the amount of cost that these farmers have to bear to meet that compliance requirement is simply lower.

(Kellie) All right I have another question. Incentives go up when prices are low, but they don't go down when prices are high. Why is that?

(Roger) That's another good question. The reason they don't go down when prices are high, if we were just looking at the commodity payments, certainly when prices were in the high range, your possibility of getting a commodity payment would be very low. The prices we're looking at are expected prices at the beginning of the season, so prices could drop a long ways to where you'd have a market year average price that would qualify you for some sort of a commodity payment. But it's not very likely. What happens, though, is that crop insurance premium subsidies vary up and down with prices so when prices get higher, the crop insurance premium subsidies get higher. In other words, as what we expect for commodity payments is lower under those high prices, the crop insurance premium subsidies would be higher, and it offsets that loss. Now when you would go from medium to low prices, you get lower crop insurance premium subsidies, but it doesn't nearly offset the increase in the commodity payments at those lower prices. So that's why we see that difference.

(Kellie) Okay, thanks Roger. That's actually all the questions that we have, so thank you all for joining us, and have a great day!

September 12, 2017