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## **Final Report**

# **The Economic Impact of Crop Insurance Indemnity Payments in Iowa, Nebraska, South Dakota and Wyoming**

## **Prepared for Farm Services Credit of America**

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## **Executive Summary**

Variability in weather, and limited access to irrigation, make crop insurance a necessity for agriculture. In particular, crop insurance is critical for agricultural producers and their communities during years when drought damages or destroys crops. This report examines the economic contribution of crop insurance indemnity payments to Iowa, South Dakota, Nebraska and Wyoming as a result of the severe drought of 2012. The report analyzes crop insurance payments received in each state, and in the agricultural districts of each state. The report also estimates the resulting economic impact in each state and in the sub-state agricultural districts of Iowa and Nebraska.<sup>1</sup>

Crop insurance indemnity payments are currently reported at \$1.88 billion in Iowa, \$1.49 billion in Nebraska, \$1.09 billion in South Dakota and \$19.6 million in Wyoming as a result of the severe 2012 drought. Further, farmers in many sub-state agricultural districts are expected to receive indemnity payments in excess of \$200,000. These payments reflect that the drought was severe throughout the Upper Midwest, though crop losses and resulting indemnity payments were lessened in Nebraska given extensive irrigation in the state.

These crop insurance indemnity payments provide a valuable economic lifeline to individual agricultural producers, allowing producers to continue with planned investments and household spending, and reducing the need to draw upon household resources such as savings or borrowing capacity. The annual economic impact from crop insurance indemnity payments, however, is less than the value of the payments themselves. There are three reasons. First, agricultural producers also paid crop insurance premiums for the 2012 growing season. While the crop insurance indemnity payments add to income in years of loss, producer-paid premiums are an annual cost. The net income gain from purchasing crop insurance in a year with a loss is the crop insurance indemnity payment minus the producer's premium payment. Second, a portion of crop insurance indemnity payments lead to increased savings rather than to a current economic impact. More precisely, receipt of crop insurance indemnity payments allow some producers to continue with planned business investments and household spending without

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<sup>1</sup> This report was commissioned by The Meyocks Group, West Des Moines, Iowa, on behalf of Farm Credit Services of America, Omaha, Nebraska.

dipping into existing savings. Third, farm investment spending on machinery and equipment, or household spending on retail items, often generates a limited economic impact at the state and agricultural-district level. The reason is that farm equipment, or household retail items, are often not manufactured within the state or district. As a result, only the “markup” portion of the purchase price is supporting the state and district economy. Consider the example of household spending on a television. Part of the spending supports the operation of the retailer that sold the television but most of the payment goes to pay the manufacturer of the television, a company which is likely to be located in another state or even another country.

The annual economic impact of crop insurance indemnity payments for the 2012-2013 season is \$1,025 million in Iowa, \$780 million in Nebraska, \$386 million in South Dakota and \$5 million in Wyoming. The combined impact across all four states was \$2,195.7 million. This impact was associated with preserving 20,900 jobs across the four states including 9,650 jobs in Iowa, 7,450 jobs in Nebraska, 3,750 jobs in South Dakota, and 50 jobs in Wyoming during that twelve-month period. These are jobs saved at agricultural suppliers and non-farm businesses throughout the economy such as retailers, restaurants, entertainment venues, and health care providers, among others. There also were large economic impacts within individual agricultural districts of Iowa and Nebraska. For example, the economic impact in the Northeast district of Nebraska was \$193 million and 2,040 jobs. The economic impact in the West Central district of Iowa was \$165 million and 1,710 jobs.

Another interesting feature of crop insurance is that the indemnity payments also help support the economy of urban areas in each state. For example, more than \$18 million in economic activity and 129 jobs were supported in the Des Moines, Iowa area (the central district of Iowa) due to crop insurance indemnity payments received in other parts of the state. Approximately \$15 million in economic activity and 114 jobs were supported in the Omaha and Lincoln, Nebraska areas (the East district of Nebraska) due to crop insurance indemnity payments received in other parts of that state.

All of these 2012 economic impact estimates refer to a drought year when many agricultural producers received indemnity payments from insurers. These annual economic impacts would not apply to a year with more normal precipitation.

Nonetheless, it should be noted that crop insurance is a positive for agricultural production in both drought and non-drought years, given that it provides an important method for agricultural producers to address risk.

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## **I. Introduction**

Variability in weather, and limited access to irrigation, make crop insurance a necessity for agriculture. The ability to partially manage external risk with insurance is essential to managing family farms and farms in general and to make the types of major investment required in modern, efficient agricultural operations. On a more practical level, crop insurance is critical for agricultural producers and their communities during years when drought or other natural phenomena damage or destroy crops. The income from crop insurance payments can play a key role in stabilizing local economies both in the year of the drought and in subsequent years. As noted in Velandia *et al.* (2009), crop insurance is a critical risk mitigation strategy for agricultural producers along with spreading sales and forward contracting. In agricultural states such as Iowa, Nebraska, South Dakota and (eastern) Wyoming, crop insurance also can play a key role in stabilizing the statewide economy.

This report examines the economic contribution of crop insurance indemnity payments to these four state economies in the year encompassing the drought of 2012. The report analyzes crop insurance indemnity payments and also estimates the total economic impact resulting from these crop insurance payments. The total economic impact includes the sales, employment, and labor income at businesses throughout the economy including agricultural suppliers, but also local restaurants, stores and service businesses. Such economic impacts can be substantial in these states where the agricultural production complex is a large part of the state economy (Thompson, *et al.* 2012)

### **A. Method for Evaluating the Economic Impact of Crop Insurance**

The direct economic impact of crop insurance programs flows from the indemnity payment received in the months following the drought event. These payments are received both in the year of the drought event and at the beginning of the year that follows. In other words, payments are received over an extended period. As a result, the economic impact from crop insurance indemnity payments is tied to the period in which the payments are received. Our first task is to document and analyze insurance indemnity payments received to date in Iowa, Nebraska, South Dakota, and Wyoming. While the

crop insurance settlement period is not yet complete, the vast majority of claims have been settled and indemnity payments to date provide the best conservative estimate of the impact of crop insurance indemnity payments for the season as a whole. The second task will be to estimate the economic impact that results from these crop insurance indemnity payments. Economic impact estimates will be developed utilizing the IMPLAN software model, which can be used to show the relationship between indemnity payments and additional economic activity at business ranging from agricultural suppliers to local retail and service businesses.

## **II. Projecting Crop Insurance Indemnity Payments**

The crop insurance analysis documents total coverage, premiums, and indemnities in the federal crop insurance program for the four states. Crop insurance data from the Federal Crop Insurance Corporation within the USDA Risk Management Agency (USDA-RMA-FCIC) and yield estimates from the USDA National Agricultural Statistics Service (USDA-NASS) provide the basis for analysis.

The crop insurance data from USDA-RMA-FCIC reveal the scale and scope of crop insurance participation in the four-state region. Table II.1 shows insured acreage relative to crop acreage and demonstrates the overwhelming degree to which producers participate in and benefit from the federal crop insurance program.

For the principal crops of corn, grain sorghum, soybeans, and wheat, crop insurance participation is generally very strong, except in states where one of those crops is no longer a major commodity, such as wheat in Iowa and to a lesser degree, grain sorghum in Nebraska. Comparing insured acreage with planted acreage, corn, soybean, and wheat producers are generally insuring more than 90% of their crops. The table also summarizes insurance coverage and acreage for all other insured crops, which includes pasture, range, and forage (PRF) insurance. PRF is a major product in Nebraska, South Dakota, and Wyoming that covers grazing or forage production through a vegetative or rainfall index program. The three states have 275,251 acres, 539,250 acres, and 769,568 acres insured respectively. Because these grazing acres do not show up in the principal crop acreage and the remaining list of insured crops and principal crops is not fully



consistent, the overall insurance percentages cannot be accurately calculated. But, it is clear that crop insurance is a critical part of the risk management portfolio for the major crops in each state.

**Table II.1. Crop Acreage and Insurance Participation**

State and Crop	Net Acres Insured*	Planted Acres of Principal Crops**	Percent of Planted Acres Insured
<b>IOWA</b>	<b>21,701,968</b>	<b>\$24,765,000</b>	
ALL OTHER CROPS			
CORN	12,902,083	14,200,000	91%
GRAIN SORGHUM	92	N/A	N/A
SOYBEANS	8,554,204	9,350,000	91%
WHEAT	5,824	18,000	32%
<b>NEBRASKA</b>	<b>15,670,600</b>	<b>\$19,371,000</b>	
ALL OTHER CROPS			
CORN	8,996,411	9,950,000	90%
GRAIN SORGHUM	51,804	145,000	36%
SOYBEANS	4,588,969	5,050,000	91%
WHEAT	1,248,042	1,380,000	90%
<b>SOUTH DAKOTA</b>	<b>14,962,052</b>	<b>\$17,625,000</b>	
ALL OTHER CROPS			
CORN	5,836,146	6,150,000	95%
GRAIN SORGHUM	104,442	200,000	52%
SOYBEANS	4,553,739	4,750,000	96%
WHEAT	2,221,480	2,405,000	92%
<b>WYOMING</b>	<b>1,220,717</b>	<b>\$1,412,000</b>	
ALL OTHER CROPS			
CORN	66,692	105,000	64%
WHEAT	123,592	150,000	82%
<b>Grand Total</b>	<b>53,555,337</b>	<b>\$63,173,000</b>	

\* Net acres insured from USDA-RMA-FCIC.

\*\* Planted acres of principal crops from USDA-NASS.

Further analysis helps explain the role of crop insurance and the total indemnity payments made to producers to offset the economic damage of crop losses. The 2012 drought and resulting yield losses were of historic proportions, with references to the 1988 drought or the 1950s as the only years with comparable severity and impacts. Crop yield estimates for 2012 are shown in Table II.2.

**Table II.2. Estimated Yields and Yield Deviations for Selected Crops\***

State and District (where available)	Corn		Grain Sorghum		Soybeans		Wheat	
	Estimated Yield	Percent Deviation from 10-Year Average	Estimated Yield	Percent Deviation from 10-Year Average	Estimated Yield	Percent Deviation from 10-Year Average	Estimated Yield	Percent Deviation from 10-Year Average
<b>IOWA</b>	<b>137.0</b>	<b>-19.5%</b>			<b>44.5</b>	<b>-8.2%</b>	<b>53.0</b>	<b>2.5%</b>
10	154.8	-11.7%			46.6	-6.5%		
20	143.9	-18.2%			43.6	-9.0%		
30	139.6	-19.7%			46.9	-3.2%		
40	127.4	-24.9%			40.8	-15.2%		
50	151.3	-14.4%			49.3	-2.2%		
60	134.7	-21.5%			49.8	0.7%		
70	121.1	-22.8%			38.9	-16.3%		
80	84.8	-40.1%			35.5	-18.8%		
90	122.1	-21.7%			46.2	-1.4%		
<b>NEBRASKA</b>	<b>142.0</b>	<b>-9.7%</b>	<b>59.0</b>	<b>-27.8%</b>	<b>41.0</b>	<b>-15.3%</b>	<b>41.0</b>	<b>-1.0%</b>
10	133.5	-9.1%			47.6	26.9%	34.0	-6.8%
20	170.9	3.4%	50.0	-8.4%	48.7	0.0%	51.1	10.4%
30	112.6	-27.1%			34.3	-25.6%	48.7	-0.2%
50	174.2	2.2%	55.3	-27.9%	52.6	0.1%	47.5	7.3%
60	142.5	-10.0%			39.8	-18.6%	48.7	2.4%
70	138.7	-7.7%	44.4	-34.8%	54.4	3.0%	48.7	10.9%
80	168.3	-1.9%	62.0	-23.9%	53.7	-4.1%	48.8	4.1%
90	128.1	-11.6%	74.1	-16.7%	39.3	-13.2%	41.6	-8.0%
<b>SOUTH DAKOTA</b>	<b>101.0</b>	<b>-17.5%</b>	<b>42.0</b>	<b>-18.6%</b>	<b>30.0</b>	<b>-15.4%</b>	<b>45.8</b>	<b>12.2%</b>
10	60.9	-14.6%	20.5	-42.1%	22.4	32.6%	31.0	-3.9%
20	127.1	7.8%			34.9	7.5%	49.9	3.9%
30	135.5	1.9%			36.7	7.8%		
40	34.9	-31.8%	34.9	4.6%			32.3	-3.7%
50	84.6	-12.5%	54.3	-3.7%	26.4	-16.7%	59.8	29.1%
60	107.6	-20.3%			32.7	-15.9%		
70	88.7	-5.5%						
80	44.9	-39.6%	43.1	-16.1%	15.8	-44.9%	49.6	20.3%
90	57.3	-55.3%			19.1	-49.8%		
<b>WYOMING</b>	<b>142.0</b>	<b>9.1%</b>					<b>25.0</b>	<b>-12.6%</b>
10								
20							23.3	-19.1%
30								
40								
50	145.5	11.3%					23.6	-17.9%

\* Estimated yields published by USDA-NASS where available, February 2013.

The yield estimates published by USDA-NASS show widespread crop losses in corn, grain sorghum, and soybeans. Estimates by agricultural statistics district allow the analysis to hone in on regionalized loss comparisons. In particular, the losses in corn in

West Central (40), Southwest (70) and South Central (80) Iowa; Northeast (30) Nebraska; and Southeast South Dakota (90) show the severity of the drought and resulting crop losses. The overall yield data for Nebraska actually understates the losses as the overall yield includes both irrigated and nonirrigated production. Yield results in irrigated production were essentially stable with average expectations, thus the losses were primarily from the nonirrigated production. Similar to Northeast Nebraska, the other regions of the state also showed substantial nonirrigated production losses, but the ratio of irrigated to nonirrigated land increases east to west and hides some of the nonirrigated losses in the overall number. Only Wyoming showed significant wheat yield losses in a region that carried lingering drought concerns through the fall of 2011 and into 2012 hurting the full wheat production period.

The relationship between yield losses and crop insurance indemnities is readily apparent when comparing yield losses in Table II.2 with crop insurance coverage and indemnities in Table II.3. The table provides an assessment of total insurance coverage and liability (or insured value at risk) as well as a summarization of farmer-paid premiums, indemnities, and net indemnities paid to date (through March 4, 2013). Approximately \$4.5 billion dollars in indemnities have been paid to date to producers in the 4-state region to offset crop losses in 2012, primarily on corn and soybeans due to drought conditions. While the crop insurance settlement period is not yet complete, the vast majority of claims have been settled and indemnity payments to date provide the best conservative estimate of the impact of crop insurance indemnity payments for the season as a whole.

The major yield losses in corn and the primary acreage devoted to corn across the region dominated as indemnities paid on corn losses topped \$3.5 billion in the 4-state region. Soybeans accounted for almost \$800 million in indemnities and together corn and soybeans represented more than 96 percent of the \$4.5 billion in indemnities paid. After adjusting for farmer-paid premiums, the net indemnities paid for crop losses in 2012 amount to nearly \$3.6 billion across the region.

**Table II.3. Crop Insurance Coverage and Indemnities by State and Crop\***

State and Crop	Net Acres Insured	Liabilities	Farmer-Paid Premium	Indemnities Paid to Date	Net Indemnities Paid to Date
<b>IOWA</b>	<b>21,701,968</b>	<b>\$14,938,802,588</b>	<b>\$381,876,854</b>	<b>\$1,883,823,136</b>	<b>\$1,501,946,282</b>
ALL OTHER CROPS	239,765	215,041,681	6,201,950	13,846,131	7,644,181
CORN	12,902,083	10,430,856,173	264,845,018	1,627,585,636	1,362,740,618
GRAIN SORGHUM	92	31,441	2,256	0	-2,256
SOYBEANS	8,554,204	4,291,423,610	110,728,054	242,277,131	131,549,077
WHEAT	5,824	1,449,683	99,576	114,238	14,662
<b>NEBRASKA</b>	<b>15,670,600</b>	<b>\$8,728,033,814</b>	<b>\$271,108,721</b>	<b>\$1,485,292,733</b>	<b>\$1,214,184,012</b>
ALL OTHER CROPS	785,374	385,691,533	11,816,861	26,323,847	14,506,986
CORN	8,996,411	5,926,963,391	173,218,862	1,140,722,872	967,504,010
GRAIN SORGHUM	51,804	15,680,823	839,592	5,307,972	4,468,380
SOYBEANS	4,588,969	2,085,985,249	66,112,545	298,787,521	232,674,976
WHEAT	1,248,042	313,712,818	19,120,861	14,150,521	-4,970,340
<b>SOUTH DAKOTA</b>	<b>14,962,052</b>	<b>\$5,383,764,576</b>	<b>\$224,537,519</b>	<b>\$1,093,323,238</b>	<b>\$868,785,719</b>
ALL OTHER CROPS	2,246,245	279,248,231	14,549,577	42,671,977	28,122,400
CORN	5,836,146	3,066,262,476	120,503,477	765,747,786	645,244,309
GRAIN SORGHUM	104,442	17,171,199	1,193,520	3,713,103	2,519,583
SOYBEANS	4,553,739	1,576,931,879	56,413,620	255,501,201	199,087,581
WHEAT	2,221,480	444,150,791	31,877,325	25,689,171	-6,188,154
<b>WYOMING</b>	<b>1,220,717</b>	<b>\$140,956,332</b>	<b>\$6,983,881</b>	<b>\$19,554,166</b>	<b>\$12,570,285</b>
ALL OTHER CROPS	1,030,433	87,425,308	4,016,900	11,514,027	7,497,127
CORN	66,692	31,821,343	1,613,357	3,785,695	2,172,338
WHEAT	123,592	21,709,681	1,353,624	4,254,444	2,900,820
<b>Grand Total</b>	<b>53,555,337</b>	<b>\$29,191,557,310</b>	<b>\$884,506,975</b>	<b>\$4,481,993,273</b>	<b>\$3,597,486,298</b>

\* Data from USDA-RMA-FCIC summary of business through March 4, 2013.

Table II.4 shows crop insurance indemnities by state and district. Differences across districts are a function of crop acreage, crop mix, and 2012 yield losses. The largest indemnities show up in the same districts showing the largest yield losses. West Central (40) Iowa had the largest indemnities, while Southwest (70) and South Central (80) Iowa indemnities were limited only by the lesser acreage of corn and soybeans in those regions. Northeast (30) Nebraska and Southeast South Dakota (90) led the region in indemnity payments due to the severity of yield losses, the sizable corn acreage, and the relative concentration of nonirrigated corn production in those regions.

**Table II.4. Crop Insurance Coverage and Indemnities by State and District\***

State and Crop	Net Acres Insured	Liabilities	Farmer-Paid Premium	Indemnities Paid to Date	Net Indemnities Paid to Date
<b>IOWA</b>	<b>21,701,968</b>	<b>\$14,938,802,588</b>	<b>\$381,876,854</b>	<b>\$1,883,823,136</b>	<b>\$1,501,946,282</b>
10	3,302,510	2,282,067,438	51,090,575	194,821,087	143,730,512
20	2,956,503	2,125,601,501	53,785,132	235,047,258	181,262,126
30	2,302,060	1,700,435,882	36,412,640	249,914,383	213,501,743
40	3,341,917	2,326,700,493	63,986,533	413,616,976	349,630,443
50	3,087,609	2,267,510,320	54,577,211	125,824,612	71,247,401
60	2,117,098	1,527,803,602	37,337,140	186,602,916	149,265,776
70	1,890,659	1,145,026,350	32,458,672	160,848,415	128,389,743
80	1,116,680	587,540,736	22,214,798	175,936,797	153,721,999
90	1,586,932	976,116,266	30,014,153	141,210,692	111,196,539
<b>NEBRASKA</b>	<b>15,670,600</b>	<b>\$8,728,033,814</b>	<b>\$271,108,721</b>	<b>\$1,485,292,733</b>	<b>\$1,214,184,012</b>
10	1,401,598	490,823,002	22,194,527	52,869,300	30,674,773
20	647,838	381,297,799	12,535,830	41,760,469	29,224,639
30	2,832,237	1,694,514,196	46,287,718	589,324,150	543,036,432
50	1,636,696	1,038,323,357	33,025,492	95,142,709	62,117,217
60	3,178,144	1,931,377,759	49,994,625	281,376,847	231,382,222
70	1,835,688	885,157,309	38,535,677	171,407,710	132,872,033
80	1,605,817	967,788,713	28,239,150	80,429,780	52,190,630
90	2,532,582	1,338,751,679	40,295,702	172,981,768	132,686,066
<b>SOUTH DAKOTA</b>	<b>14,962,052</b>	<b>\$5,383,764,576</b>	<b>\$224,537,519</b>	<b>\$1,093,323,238</b>	<b>\$868,785,719</b>
10	1,077,386	120,953,093	8,461,916	18,596,189	10,134,273
20	2,949,290	1,174,468,013	54,034,405	46,325,972	-7,708,433
30	2,057,097	929,653,336	36,753,586	39,640,920	2,887,334
40	954,161	113,976,324	9,147,923	28,431,599	19,283,676
50	2,279,433	735,299,478	36,588,859	108,944,122	72,355,263
60	2,244,361	1,097,791,348	30,506,952	198,194,825	167,687,873
70	206,683	32,751,295	2,338,729	8,629,873	6,291,144
80	1,043,018	192,935,829	11,616,421	61,512,840	49,896,419
90	2,150,623	985,935,860	35,088,728	583,046,898	547,958,170
<b>WYOMING</b>	<b>1,220,717</b>	<b>\$140,956,332</b>	<b>\$6,983,881</b>	<b>\$19,554,166</b>	<b>\$12,570,285</b>
10	120,333	64,841,306	2,419,470	1,913,079	-506,391
20	381,336	10,624,857	861,239	4,871,404	4,010,165
30	6,226	688,600	21,283	8,406	-12,877
40	13,978	712,092	37,585	58,066	20,481
50	698,844	64,089,477	3,644,304	12,703,211	9,058,907
<b>Grand Total</b>	<b>53,555,337</b>	<b>\$29,191,557,310</b>	<b>\$884,506,975</b>	<b>\$4,481,993,273</b>	<b>\$3,597,486,298</b>

\* Data from USDA-RMA-FCIC summary of business through March 4, 2013.

From Tables II.3 and II.4, the total indemnities for the 2012 crop year in the 4-state region are estimated at approximately \$4.5 billion, or more than \$80 per acre on the 53,555,337 acres insured across the region. This is a conservative estimate as the claims

and settlement process continues and some additional indemnities are yet to be paid. The remaining indemnity payments will likely continue to accrue over the next few months, but the vast majority of claims have been settled by this time, providing some confidence in the current number as a conservative proxy for the total. One reason for the continued reporting of claims to date is the lengthy process for settlement due to the number of claims as well as the size of claims and the need for production audits on very large claims.

### **III. Economic Impact Estimates**

The economic impact analysis examines the total economic activity resulting from crop insurance indemnity payments. There are two components to the economic impact of crop insurance. The first component is the maintenance of business investment spending by agricultural producers. The second component is the maintenance of the household spending of agricultural producers. Crop insurance indemnity payments help farm producers maintain more of the normal spending patterns on both items during a drought, rather than having to cut back on farm investment and household spending. The economic impact is the additional spending that would occur during a year-period due to agricultural producers participating in a crop insurance program. The year-period is defined as the beginning of a growing season to the period just before the next growing season rather than a calendar year. The use of this agricultural year rather than a calendar year makes it possible to capture the growing season period when the crops are insured through to the fall and the winter period when most crop insurance payments would be received and when the crop insurance indemnity payments would influence spending by the businesses and households of agricultural producers.<sup>2</sup> For example, if crop insurance payments allow a farmer to purchase agricultural equipment, this spending will support wholesalers in the state, and may support equipment manufacturers within the state.

The overall economic impact of the agricultural sector is the sum of the economic impact from farm investment and household income supported by crop insurance indemnity payments. The IMPLAN model software developed by the Minnesota

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<sup>2</sup> While some crop insurance indemnity payments may be received in the period after the next growing season begins, it is assumed that there would still lead to increased spending during the agricultural year.

IMPLAN Group can be used to calculate economic impact for each dollar of investment in farm equipment and each additional dollar of farm household income. Specifically, the IMPLAN model captures the supply and demand structure of the economy, so that the model can identify all of the industries that will benefit when farm equipment is purchased from farm implement wholesalers. Firms that supply electricity or business services to the farm implement wholesaler would benefit, as would businesses patronized by the employees of the wholesalers as they spent their paychecks on food, shelter, health care, recreation, and the other components of household spending. The IMPLAN model calculates the total additional economic activity at wholesalers, retailers, restaurants and other business throughout the economy when crop insurance helps maintain farm income during drought. To understand how the IMPLAN model works, consider spending on farm equipment at equipment dealers. This business to business transaction would be classified in the wholesale trade industry. An economic multiplier of 1.5 would imply that there is \$0.50 in additional economic activity generated in the state for each \$1.00 of money spent on wholesale trade services. As noted earlier, this extra \$0.50 in economic activity would reflect the purchases of the wholesaler (a farm equipment dealer) as they buy supplies to operate their business, or would reflect the wholesaler's employees as they spend their paychecks. The total economic impact would be \$1.50 dollars

However, economic multipliers also can be calculated for other key economic concepts such as labor income and employment. For example, a labor income multiplier of 0.6 for the wholesale services industry would mean that there would be \$0.60 in labor income generated in the state economy for each \$1.00 of spending on wholesale trade services. There are similar multipliers for employment.

Such multipliers would need to be calculated for farm investment on equipment and for farm household income. This is feasible since the IMPLAN software can generate economic impact estimates for hundreds of individual industries and for 7 income groups in every U.S. county or state, or combinations of counties and states. Thus the IMPLAN model can be used to calculate multiplier effects for household income and for every type of spending by agricultural producers at both the state level, and within the agricultural districts of each state.

This report calculates the total economic impact of crop insurance indemnities during the year defined by the growing season of 2012 (April 2012 through March 2013) in four states: Iowa, Nebraska, South Dakota and Wyoming. The focus is on net crop insurance indemnity payments which is equal to the indemnity payments received minus the crop insurance premium payments made by agricultural producers (i.e. excluding the premium subsidy) (Leatham, et al., 1997). These net indemnity payments are significant this year due to the severity of the 2012 drought, especially in this four-state region. As described above, the total economic impact will reflect sales (output), value-added, labor income, and employment at businesses throughout the economy in each state. There also will be an agricultural district-level analysis in the States of Iowa and Nebraska. These two states have a more diverse agricultural economy than Wyoming and the drought was more widespread in these two states than in South Dakota. There are a total of 8 agricultural districts in the State of Nebraska and 9 agricultural districts in the state of Iowa. Figure III.1 shows the counties in each agricultural district in Nebraska and Figure III.2 shows the counties in each agricultural district in Iowa.

Figure III.1: Agricultural Districts of Nebraska

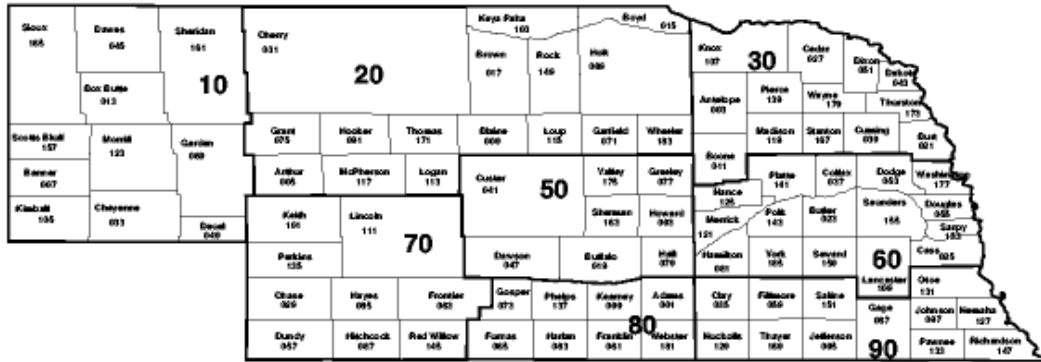
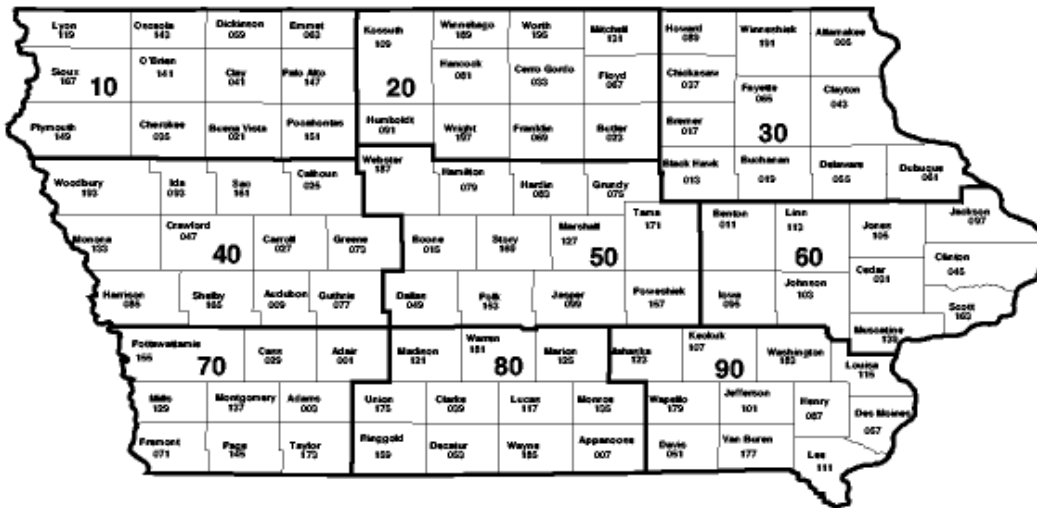




Figure III.2: Agricultural Districts of Iowa



Another feature of the IMPLAN model is that it can be used to calculate how spending in one area generates an economic impact in another area. For example, the model could be used to show how crop insurance indemnity payments received in the Northeast District of Nebraska (District 30) would generate an economic impact on the East District (Omaha and Lincoln) of Nebraska (District 60). This feature of the IMPLAN modeling software makes it possible to show how the crop insurance indemnity payments earned in one district yield an economic impact on that district, but also on the metropolitan districts in a state. This type of analysis is critical as it can be used to provide specific estimates for a concept that is well understood; that agricultural activity and income in rural Nebraska and Iowa (and South Dakota and Wyoming) have a significant economic impact on the metropolitan areas of each state. This study will estimate this impact for the case of income from crop insurance indemnity payments.

As noted above, calculating the economic impact of net crop insurance indemnity payments is an exercise in considering what additional spending would occur because indemnity payments are available. For example, a particular agricultural producer may have proceeded with similar expenditures in the year following the drought whether or not indemnity payments are available. However, the presence of net crop insurance payments may allow that producer to proceed with rather than cancel planned equipment purchases. Similarly, crop insurance payments may allow households to carry on with

planned levels of household spending rather than cut back on spending. Indemnity payments also will help producers reduce drawing down savings as a result of the drought.

We model net crop insurance indemnity payments as going into at least three potential uses: 1) agricultural equipment purchases, including vehicles; 2) household spending, or 3) savings. Data from the United States Department of Agriculture (2012) indicates that farmers spend approximately 17% of net farm income on machinery, equipment and vehicles. This percentage is adopted for spending net crop insurance indemnity payments. The remainder goes to support household spending or savings. Household spending refers to typical household expenditures. Households also save a share of their income, particularly households with significant assets or higher incomes. Of course, crop insurance indemnity payments would not necessarily lead to extra savings, but can help agricultural producers avoid dipping into savings or extending borrowing, as may have been necessary absent the indemnity payments. This report assumes a savings rate from crop insurance indemnity income that is typical of upper middle class and high income households.

The presence of savings implies that the economic impact will be less than the net crop insurance indemnity payments. Another reason is that the full price of manufactured items reflects markups by wholesalers and retailers as well as the cost of producing the manufactured item. Unless the purchased good is manufactured in the same state, only the markup portion of wholesale or retail good purchase would reflect economic activity within the same state. Therefore only the mark-up portion of the price reflects relevant spending in wholesale and retail industries. However, a significant share of farm implements, tractors and other farm machinery and equipment are manufactured in the four states, particularly Iowa and Nebraska. Analysis using data in the IMPLAN software indicates that 22.3% of agricultural machinery and equipment production in the United States occurs in Iowa and 9.3% occurs in Nebraska. Less than 1% occurs in South Dakota and Wyoming. Therefore, for 22.3% of Iowa farm investment on machinery and equipment, the entire price of the purchase reflects economic activity in the State of Iowa. The same is true for 9.3% of Nebraska purchases and less than 1% in the other states.

**Table III.1. Total Economic Impact from Net Crop Insurance Indemnity Payments 2012 Agricultural Year**

<b>State</b>	<b>Net Crop Insurance (millions)</b>	<b>Total Economic Impact (millions \$)</b>
<b>IOWA</b>	<b>\$1,501.9</b>	<b>\$1,024.5</b>
Business Investment		\$140.4
Household Spending		\$884.1
<b>NEBRASKA</b>	<b>\$1,214.2</b>	<b>\$780.1</b>
Business Investment		\$80.4
Household Spending		\$699.8
<b>SOUTH DAKOTA</b>	<b>\$868.8</b>	<b>\$386.3</b>
Business Investment		\$38.2
Household Spending		\$348.1
<b>WYOMING</b>	<b>\$12.6</b>	<b>\$4.7</b>
Business Investment		\$0.5
Household Spending		\$4.2
<b>Grand Total</b>	<b>\$3,597.5</b>	<b>\$2,195.7</b>

Source: Authors' calculations

Table III.1 shows the net crop insurance indemnities paid in each state and the resulting economic impact in the state. The Table shows the portion of that economic impact which results in business investment and in household expenditures. There was an annual economic impact of \$1,024.5 million in Iowa. The next largest annual economic impact was \$780.1 million in Nebraska. There was an annual economic impact of \$386.3 million in South Dakota and \$4.7 million in Wyoming. The combined economic impact across all four states is \$2,195.7 million.

The annual economic impact is measured in terms of business output. Business output is the most comprehensive measure of economic impact since it is equivalent to business receipts. Business receipts provide the revenue to support labor income, returns to capital and the profits of businesses as well as the purchased inputs to production. Value-added is the sum of the labor income, returns to capital and profit components of output. The value-added impact is also reported along with the labor income impact and the employment impact. As noted above, labor income is a component of value-added

and value-added is a component of output, implying that the three measures must be reported separately and cannot be added together.

Measures of the total economic impact in terms of output can be used to estimate the value-added impact, the labor income impact, and the employment impact. This is possible because ratios between output and value-added, output and labor income and output and employment are each available from the IMPLAN modeling system. Table III.2 reports the four measures of economic impact for each state, utilizing these IMPLAN ratios. Results show that the net crop insurance indemnity payments during the drought year saved 20,900 jobs across the four states during the year with an annual labor income \$721.2 million. These are jobs saved at agricultural suppliers and non-farm businesses throughout the economy such as retailers, restaurants, entertainment venues, health care providers, utility providers, rental companies, and insurance companies.

**Table III.2. Total Economic Impact from Net Crop Insurance Indemnity Payments 2012 Agricultural Year, Output, Value-Added, Labor Income and Employment**

State	Output (Millions \$)	Value-Added (Millions \$)	Labor Income (Millions \$)	Employment
IOWA	\$1,024.5	\$613.8	\$334.5	9,650
NEBRASKA	\$780.1	\$471.0	\$260.1	7,450
SOUTH DAKOTA	\$386.3	\$238.4	\$125.2	3,750
WYOMING	\$4.7	\$3.0	\$1.5	50
	<b>\$2,195.7</b>	<b>\$1,326.1</b>	<b>\$721.2</b>	<b>20,900</b>

Source: Authors' calculations

In Iowa, 9,650 jobs were saved during the year with an annualized labor income impact is \$334.5 million. The labor income impact was \$260.1 million spread among 7,450 jobs in Nebraska. The labor income impact was \$125.2 million in South Dakota spread over 3,750 jobs.

Table III.3 shows how the economic impact is in the 8 agricultural districts within Nebraska and the 9 agricultural districts of Iowa. The reported figures are the economic impact within each region. The economic impact is reported in terms of output, value-added, labor income, and employment. The regional pattern for the direct economic impact follows the pattern for crop insurance indemnity payments. The largest impacts in Nebraska are in the Northeast district of the state as well as in the East district, which

includes both Omaha and Lincoln. The largest economic impacts in Iowa were in the West Central and Northeast districts.

**Table III.3. Total Economic Impact from Net Crop Insurance Indemnity Payments 2012 Agricultural Year Impact by Iowa and Nebraska District**

State and District	Output (Millions \$)	Value-Added (Millions \$)	Labor Income (Millions \$)	Employment
<b>IOWA</b>				
Northwest (10)	\$58.6	\$35.1	\$17.1	610
North Central (20)	\$71.7	\$43.9	\$21.7	760
Northeast (30)	\$124.4	\$74.5	\$40.5	1,250
West Central (40)	\$165.4	\$102.6	\$53.1	1,710
Central (50)	\$49.9	\$31.6	\$17.8	470
East Central (60)	\$96.7	\$59.5	\$32.6	960
Southwest (70)	\$58.2	\$36.5	\$17.9	620
South Central (80)	\$64.2	\$39.4	\$18.5	690
Southeast (90)	\$53.3	\$31.9	\$16.4	570
<b>NEBRASKA</b>				
Northwest (10)	\$11.8	\$7.2	\$3.7	130
North (20)	\$7.5	\$4.5	\$2.0	80
Northeast (30)	\$193.3	\$114.0	\$54.9	2,040
Central (50)	\$28.4	\$17.0	\$8.9	300
East (60)	\$166.5	\$102.9	\$58.2	1,560
Southwest (70)	\$53.8	\$32.7	\$16.6	550
South (80)	\$20.7	\$12.5	\$6.1	220
Southeast (90)	\$43.6	\$26.0	\$11.6	460

Source: Authors' calculations

Table III.4 shows what the net crop insurance indemnity payments in the 7 other agricultural districts in Nebraska contribute to the economic impact in the East district. The East district of Nebraska contains Omaha and Lincoln, the two metropolitan areas of the state. The multiplier impact in the East district is presented in terms of annual output, value-added, labor income and employment in Table III.4.

Net crop insurance indemnity payments to the rural districts during the 2012-2013 agricultural year generated an economic impact of approximately 114 jobs in Omaha and Lincoln, Nebraska and 129 jobs in Des Moines, Iowa. In other words, crop insurance

payments in other parts of Nebraska and Iowa support a significant amount of employment in the major metropolitan areas of each state.

**Table III.4. Economic Impact on the Omaha/Lincoln Metropolitan Areas in Nebraska and Des Moines Metropolitan Area in Iowa**

State and District	Output (Thousands \$)	Value-Added (Thousand \$)	Labor Income (Thousands \$)	Employment
<b>DES MOINES</b>				
Northwest (10)	\$518.1	\$302.1	\$173.3	3
North Central (20)	\$2,398.7	\$1,422.4	\$918.4	17
Northeast (30)	\$1,354.7	\$800.3	\$458.0	9
West Central (40)	\$4,305.1	\$2,566.5	\$1,571.3	30
East Central (60)	\$1,141.9	\$689.3	\$458.7	8
Southwest (70)	\$1,171.3	\$685.8	\$388.0	7
South Central (80)	\$5,644.6	\$3,501.7	\$2,192.5	43
Southeast (90)	\$1,216.3	\$745.1	\$475.4	12
<b>OMAHA/LINCOLN</b>				
Northwest (10)	\$46.3	\$26.8	\$14.2	0
North (20)	\$94.7	\$56.6	\$35.5	1
Northeast (30)	\$8,043.9	\$4,733.4	\$2,956.0	61
Central (50)	\$1,051.9	\$626.7	\$385.8	8
Southwest (70)	\$884.7	\$513.3	\$333.1	7
South (80)	\$631.8	\$373.9	\$241.7	5
Southeast (90)	\$3,929.7	\$2,353.7	\$1,487.7	32

Source: Authors' calculations

#### IV. Conclusion

This study summarized crop insurance indemnity payments for Iowa, South Dakota, Nebraska and Wyoming as a result of the severe drought of 2012, as well as the economic impact of those indemnity payments. The crop insurance indemnity payments to-date are \$1.88 billion in Iowa, \$1.49 billion in Nebraska, \$1.09 billion in South Dakota and \$19.6 million in Wyoming. The study also examined the crop insurance indemnity payments in individual districts in each state, in particular the 9 agricultural districts of Iowa and the 8 agricultural districts of Nebraska. Many individual districts received crop insurance indemnity payments in excess of \$200,000, again as a result of the severity of the 2012 drought.

These indemnity payments provide a valuable economic lifeline to individual agricultural producers, allowing producers to continue with planned investments and household spending, and reducing the need to draw upon household resources such as savings. The crop insurance indemnity payments as a result have a substantial economic impact on the economy of the four states. This study examined the economic impact of indemnity payments for Iowa, South Dakota, Nebraska and Wyoming, and the economic impact on individual agricultural districts within Iowa and Nebraska. The economic impact was estimated for the year running from the beginning of the 2012 growing season into the year 2013, before the beginning of the 2013 growing season.

The annual economic impact from crop insurance indemnity payments is less than the value of the payments themselves. There are three reasons. First, agricultural producers made crop insurance premium payments for the 2012 growing season. These payments should be subtracted from the gross crop insurance indemnity payment receipts. Second, a portion of crop insurance indemnity payments lead to increased savings rather than to current economic impact. More precisely, receipt of crop insurance indemnity payments allow some producers to continue with planned business investments and household spending without dipping into existing savings. Third, farm investment spending on machinery and equipment, or household spending on retail items, often generates a limited economic impact at the state and district level. The reason is that farm equipment is often not manufactured within the state or district. As a result, only the “markup” portion of the purchase price is supporting the state and local economy. Consider the example of household spending on a television. Part of the spending supports the operation of the retailer that sold the television but most of the payment goes to pay the manufacturer of the television, a company which is likely to be located in another state or even another country.

The net indemnity payments as a result of the severe drought were \$3,597.5 million in the four states. The annual economic impact of crop insurance indemnity payments for the 2012-13 agricultural year was \$1,025 million in Iowa, \$780 million in Nebraska, \$386 million in South Dakota and \$5 million in Wyoming. There were 9,650 jobs preserved in Iowa, 7,450 jobs in Nebraska, 3,750 jobs in South Dakota, and 50 jobs in Wyoming during that year. The combined economic impact across all four states was

\$2,195.7 million, including 20,900 jobs saved. These are jobs saved at agricultural suppliers and non-farm businesses throughout the economy such as retailers, restaurants, entertainment venues, and health care providers, among others.

There also were large economic impacts within individual agricultural districts of Iowa and Nebraska. For example, the economic impact in the Northeast district of Nebraska was \$193 million and 2,040 jobs. The economic impact in the West Central district of Iowa was \$165 million and 1,710 jobs.

Another interesting feature of crop insurance is that the indemnity payments also help support the economy of urban areas in each state. For example, \$18 million in economic activity and 129 jobs were supported in the Des Moines area (the Central district of Iowa) due to crop insurance indemnity payments received in other parts of the state. Approximately \$15 million in economic activity and 114 jobs were supported in the Omaha and Lincoln, Nebraska area (the East district of Nebraska) due to crop insurance indemnity payments received in other parts of that state.



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## **Appendix 1: About the Authors**

### **Dr. Brad Lubben**

Dr. Lubben is Extension Assistant Professor, Policy Specialist, and Director of the North Central Risk Management Education Center at the University of Nebraska-Lincoln. Dr. Lubben has 20 years of experience as an extension economist and policy specialist and has been at Nebraska since 2005, when he completed his Ph.D. in Agricultural Economics at Kansas State University. Dr. Lubben's expertise is in the area of farm policy and risk management and includes research and education activities related to farm policy development, farm bill proposals, and producer decision making under risk as well as classroom instruction on agricultural policy development and issues. Dr. Lubben's work has been funded by several agencies and organizations, including the Farm Foundation, the Nebraska Corn Board, the Nebraska Soybean Board, and the United States Department of Agriculture National Institute of Food and Agriculture. One of the current research projects "Farm Income, Policy, and Risk Management for Nebraska Corn Producers" continues a focus on producer decision-making and selection of farm program, crop insurance, and marketing tools under yield and price uncertainty.

### **Dr. Eric Thompson**

Dr. Thompson is the Director of the Bureau of Business Research and an Associate Professor of Economics at the University of Nebraska-Lincoln. Dr. Thompson has conducted a broad group of economic impact studies, demographic projections, and analyses of economic development programs for Nebraska and cities in Nebraska. He has conducted studies of irrigation policy in the Republican River Basin and for the South Platte Natural Resources District and co-authored the report *The 2010 Economic Impact of the Nebraska Agricultural Production Complex*. Thompson's research has received support from the United States Department of Labor, the Robert Wood Johnson Foundation, the Center for Economic Analysis, the Nebraska Health and Human Services System, the Lincoln Partnership for Economic Development, the Lincoln Chamber of Commerce, the Omaha Chamber of Commerce, and the Nebraska Department of Economic Development. In his previous employment, Dr. Thompson served as the

Director of the Center for Business and Economic Research and a Research Associate Professor of Economics at the University of Kentucky. Dr. Thompson received his Ph.D. in agricultural economics from the University of Wisconsin-Madison in 1992. His research fields include regional economics, economic forecasting, and state and local economic development. His research has been published in *Regional Science and Urban Economics*, the *Journal of Regional Science*, the *American Journal of Agricultural Economics*, the *Journal of Cultural Economics*, and the *Economic Review of the Federal Reserve Bank of Cleveland*.