Final Report on
Balancing Environmental and Feed Availability Concerns

A Project for the National Pork Producers Council and associated state councils

July 1, 2012

Chad Hart, Keri Jacobs, and Kodjo Drofenou
Department of Economics
Iowa State University

Project Goal: To increase feed availability while maintaining environmental quality under a restricted federal budget

Objectives:
1) Assess productivity of land currently enrolled in the Conservation Reserve Program (CRP),
2) Examine scenarios of targeted release of CRP lands based on environmental and budgetary guidelines, and
3) Project feed market conditions under such scenarios.

Project Period: Sept. 1, 2011 to June 30, 2012

Contents

Based on continuing concerns about feed availability, we have contracted with the National Pork Producers Councils and associated state councils to perform a detailed analysis of the potential for feed production on CRP acreage. This analysis explores the distribution of CRP land by crop productivity (as measured by corn suitability rating, soil rental rates, or productivity indices) and examines the feed production and environmental impact of returning some CRP acreage to production. Given the concerns about feed availability and the likelihood that CRP will be reduced as the Congress looks for budget savings to apply for deficit reduction, it makes sense to examine modifications to CRP that would maintain, as well as possible, environmental benefits while reducing land mass and funds used in the program.

Throughout this project, we explore four national scenarios. The first scenario examines a prohibition on new general sign-ups for CRP over the next two years. The second scenario uses the early release rules for CRP lands that were implemented for a brief time in 1996. The third and fourth scenarios work off these same rules, but modify the level of the erodibility index rating for targeted lands. In all of these scenarios, the largest shifts are expected from CRP lands in grasses. Treed, habitat, and wetland CRP lands are less likely to shift back to crop production. Also, given that much of the CRP land is in the Great Plains, the natural crop that CRP land would return is wheat. Thus, our modeling structure will incorporate the possibility of wheat production being the major target for released CRP lands, in essence strengthening the wheat belt in the western Great Plains, with corn production possibly replacing wheat in the eastern Great Plains.

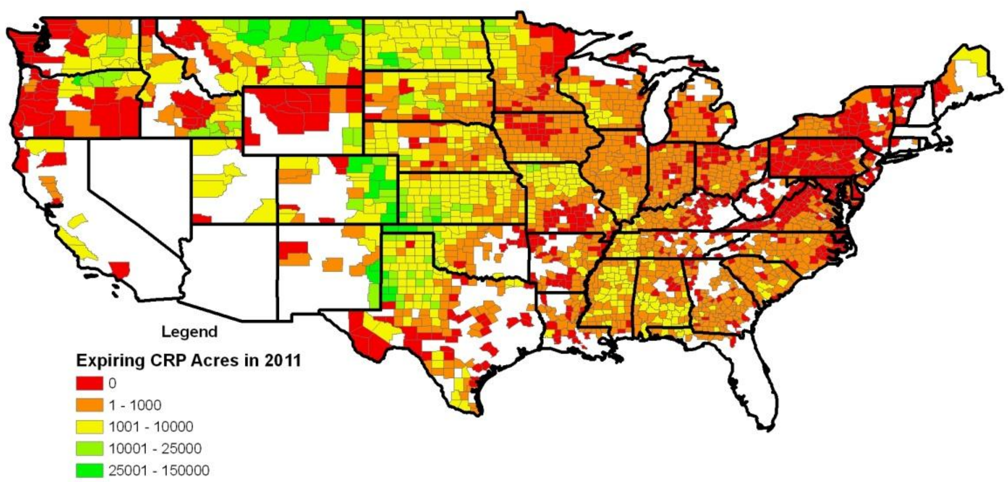
We have obtained data on CRP acreage by soil type and conservation practice from USDA-FSA. As the soil types listed in the FSA data are determined by state conventions, they do not provide a consistent basis for examining soil characteristics. Thus, we combined the CRP data from USDA-FSA with the Iowa Soil Properties and Interpretations Database and USDA-NRCS' Soil Data Mart to examine the environmental and productivity profile for CRP lands. USDA-NRCS provided the data to create a consistent basis for examining soil characteristics across the nation. This data was required to evaluate the environmental impacts and to proceed on the latter three scenarios for this project. This final report examines the feed availability impacts from all of the scenarios of the project, a prohibition on CRP renewals via a general sign-up through 2013 and the targeted release of CRP grasslands given erodibility indices.

Scenario 1: Prohibition on CRP Renewals

For this first scenario, we have assumed that there will not be a general sign-up for CRP over the next two years and that the acres expiring from the CRP general sign-up in 2011, 2012, and 2013 will transition out of the program. Table 1 details the state-level acreage numbers for the acres that would transition from CRP. In total, 4.25 million acres expired in 2011. 6.26 million acres are scheduled to expire in 2012. 3.11 million acres are set to expire in 2013. The release of this acreage is not uniform across the country as much of the land in CRP is concentrated in the Great Plains. For the 2011 expirations, Texas had the most at 683,154 acres. Kansas, Montana, North Dakota, and Colorado round out the top five. Those same states make up the top 5 in 2012 as well, with both North Dakota and Texas having over 800,000 acres that could emerge from CRP. In 2013, Kansas falls out of the top five and is replaced by Washington. Given the location of these lands, wheat would likely have been the original crop on this land before it was enrolled in CRP and would also be the most likely crop on the land if it transition out of CRP.

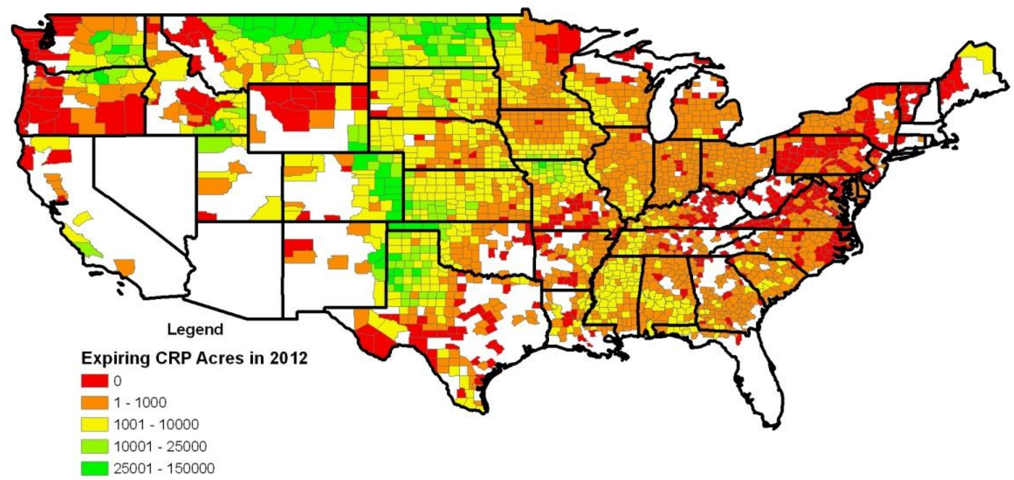
To provide some additional context, Figures 1-3 are county-level maps of the expiring CRP acreage. As the maps show, the 2011 expirations are concentrated in the eastern two-thirds of Montana, all of North Dakota, eastern Colorado, western Kansas and the panhandle of Texas. In 2012, areas in northern Missouri and eastern Washington also provide significant acreage. By 2013, the pattern of expirations becomes more diffuse across the nation.

Figure 1. Expiring CRP Acres in 2011



Currently, 72% of the CRP general signup land is devoted to grasses, with the rest in trees, wildlife habitats, and waterways. As these other land uses contribute relatively more environmentally on a per-acre basis. We constrained our analysis to the grassed CRP area and assumed any row-crop production from expired CRP acreage would come from the grassed acreage. As this land would be farmed like surrounding cropland, we examined county acreage availability from CRP, state-level cropping patterns in 2011, and relative forward-looking crop pricing patterns from futures, to determine the percentage of the expiring grassed CRP land that would enter corn production. In a state like Montana, while CRP area is plentiful, corn production is very small. Thus, our model projects a very small percentage, roughly 1%, of expiring Montana CRP land to move into corn production. Iowa, on the other hand, has a much smaller number of expiring CRP acres, but those acres are much more likely to be converted to corn production.

Figure 2. Expiring CRP Acres in 2012



Once the model determined the CRP acreage entering corn production, we then assigned that acreage projected yields based on 80% of the county's 20-year corn trend yield. For counties where trend yields could not be determined, the yield assigned was 80% of the minimum trend yield found in the state. We assumed a normal harvesting rate of 91% of the acreage, based on recent national data. Figures 4, 6, and 8 show the expected corn production of the expiring grassed CRP acres over the next three years. The second and third columns of Table 2 detail the total national changes in corn area and production directly from the CRP land shift.

Figure 3. Expiring CRP Acres in 2013

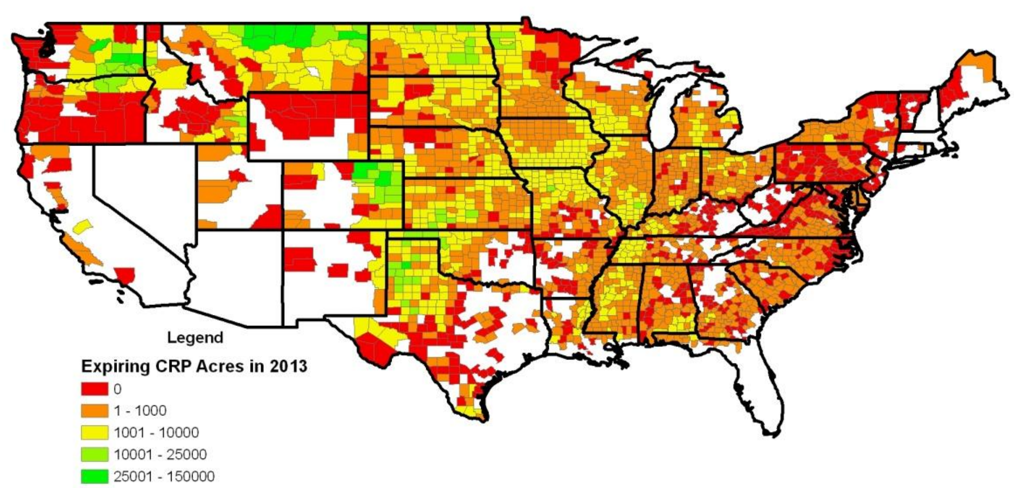
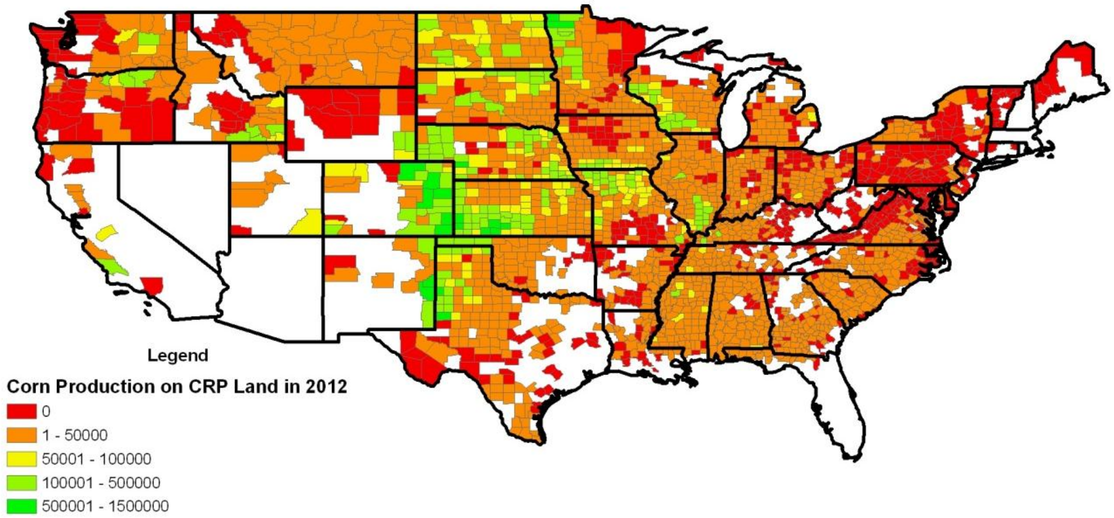


Table 1. Acres Expiring from CRP General Signups

State	2011	2012	2013
Alabama	80,819	78,512	35,054
Arkansas	12,291	32,052	14,044
California	17,581	23,173	5,967
Colorado	345,403	571,285	222,212
Connecticut	10	28	10
Delaware	-	110	244
Florida	9,545	11,896	6,342
Georgia	23,474	33,394	15,112
Idaho	116,378	165,043	67,831
Illinois	44,417	77,739	146,355
Indiana	12,102	26,062	41,566
Iowa	37,306	175,292	141,193
Kansas	528,950	511,628	207,067
Kentucky	33,133	40,931	30,126
Louisiana	11,767	37,289	23,416
Maine	5,530	5,246	404
Maryland	148	470	542
Michigan	9,398	17,438	43,446
Minnesota	112,360	249,172	114,538
Mississippi	100,753	164,379	60,066
Missouri	192,731	368,981	178,366
Montana	495,360	695,736	361,828
Nebraska	148,049	197,569	91,404
New Jersey	311	159	246
New Mexico	164,790	121,194	9,643
New York	2,375	3,279	4,086
North Carolina	11,294	10,288	7,274
North Dakota	374,631	829,024	250,634
Ohio	7,974	19,624	52,178
Oklahoma	191,325	191,563	75,838
Oregon	103,969	89,385	54,504
Pennsylvania	950	768	912
South Carolina	19,617	31,159	6,203
South Dakota	121,636	220,989	101,650
Tennessee	33,770	27,470	50,550
Texas	683,154	822,344	360,767
Utah	18,173	27,675	3,736
Vermont	49	-	-
Virginia	4,216	4,474	4,120
Washington	84,362	247,028	244,841
West Virginia	160	95	87
Wisconsin	42,521	66,099	68,979
Wyoming	49,970	60,708	5,263

Figure 4. Corn Production on Expired CRP Acres in 2012



This direct impact is not the only impact though. While corn captures a significant portion of the expired CRP lands, other crops, especially wheat, capture more. This crop acreage shift causes a rebalancing of croplands outside of CRP, with wheat gaining most of the CRP land and former wheat area outside of CRP shifting to corn. As we would expect this shift to have a greater impact in higher corn producing regions, we based the shift on the relative trend yields for corn by county across the state. Counties with higher corn trend yields have a larger proportion of their area move to corn. As the land we are discussing here is already in crop production, we do not discount the corn yield potential from the county trend. Figures 5, 7, and 9 show the additional corn production from shifting croplands outside of CRP. The fourth and fifth columns of Table 2 detail the total national changes in corn area and production indirectly from the CRP land shift.

Figure 5. Additional Corn Production from Shifting Croplands Outside of CRP in 2012

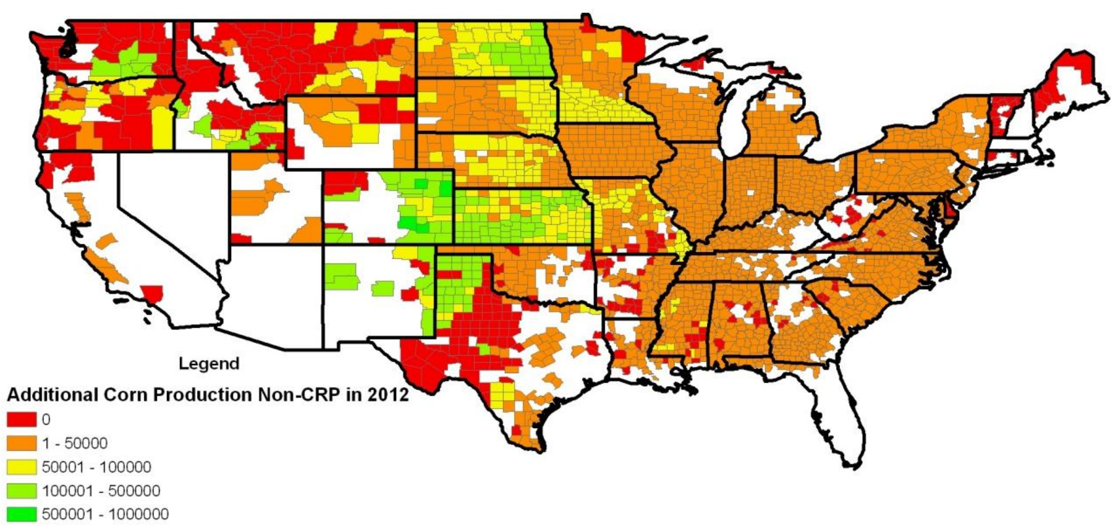


Figure 6. Corn Production on Expired CRP Acres in 2013

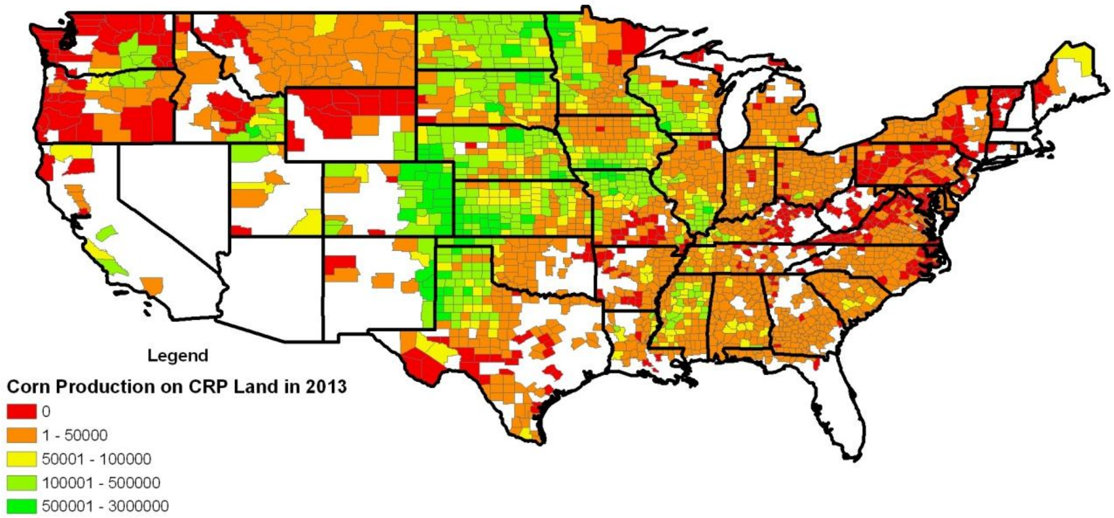
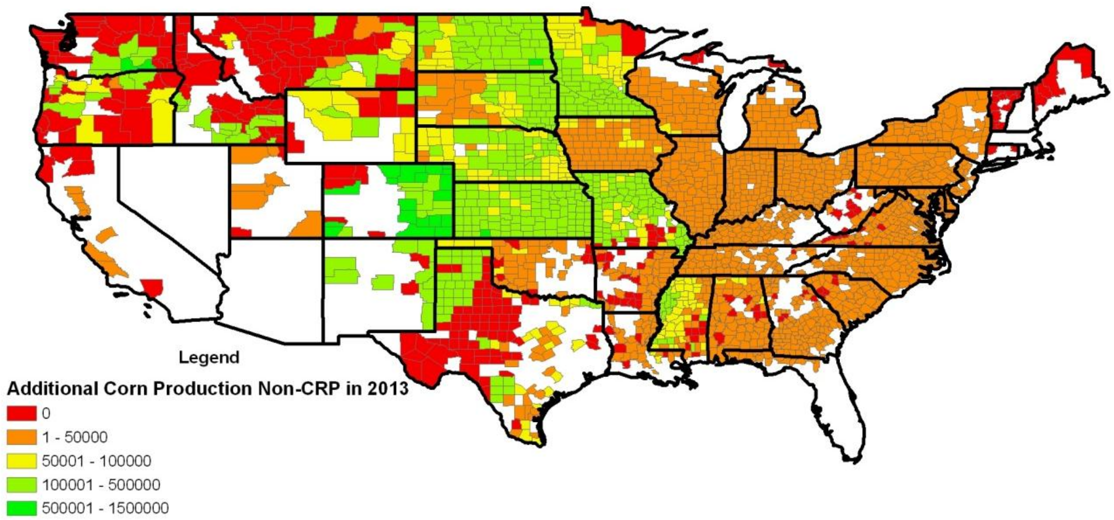


Figure 7. Additional Corn Production from Shifting Croplands Outside of CRP in 2013



As Table 2 details, the impacts for corn are relatively small, but still significant. In 2012, the U.S. acreage devoted to corn would increase 1.2 million acres and produce an additional 138 million bushels. Given the 2011 corn data of 91.9 million acres and 12.31 billion bushels, this represents a 1.3% increase in corn plantings and a 1.1% increase in production. As the additional corn area is outside of the major corn producing region, it is not surprising that the area increase is greater than the production increase. The additional boost in 2013 would bring corn area up nearly 3 million acres and 334 million bushels. By 2014, the increases would reach 3.9 million acres and 447 million bushels. Again, based on 2011, that would represent a 4.2% increase in corn area and a 3.6% increase in corn production.

Figure 8. Corn Production on Expired CRP Acres in 2014

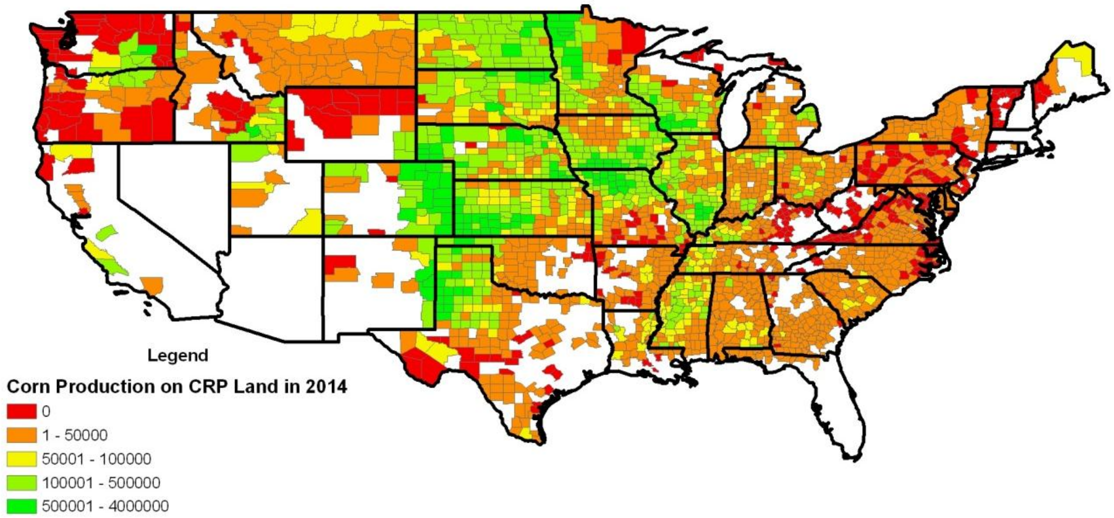


Figure 9. Additional Corn Production from Shifting Croplands Outside of CRP in 2014

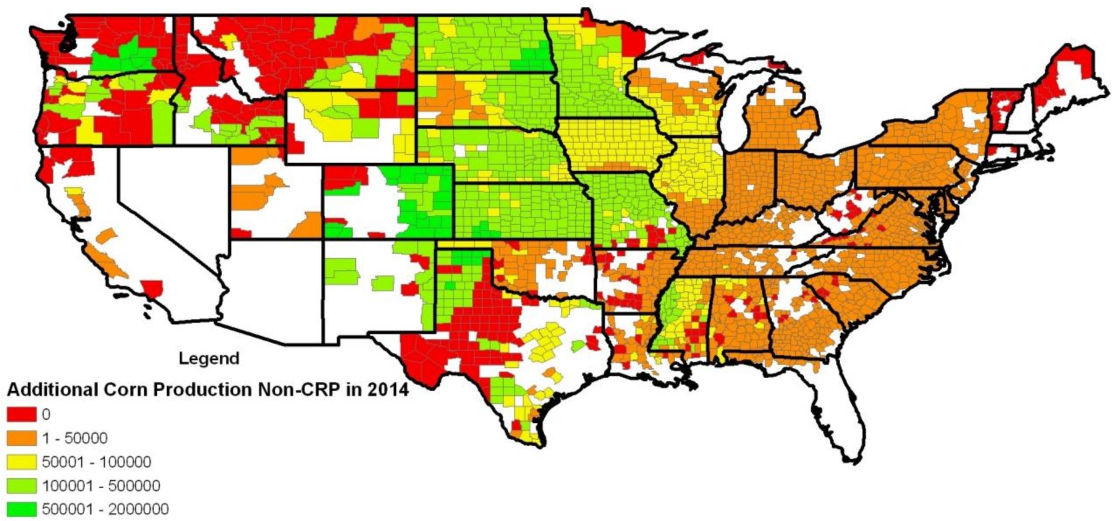


Table 2. Summary for Scenario 1

	Directly from CRP lands		Indirectly from lands outside of CRP		Total	
Year	Acres	Bushels	Acres	Bushels	Acres	Bushels
2012	704,472	71,150,269	505,375	66,722,214	1,209,847	137,872,483
2013	1,837,730	186,145,201	1,112,077	147,480,336	2,949,807	333,625,536
2014	2,493,045	257,515,737	1,418,227	189,728,726	3,911,271	447,244,463

Table 3 details the cumulative state-level corn shifts over the three years. In 2012, Kansas, Colorado, Texas, and Nebraska would each increase corn production by over 10 million bushels. By 2013, 10 states would reach the 10 million bushel increase mark, with Kansas and Colorado

Table 3. State-level Impacts on Corn Production, Scenario 1

	Additional Acres			Additional Bushels		
State	2012	2013	2014	2012	2013	2014
Alabama	20,258	37,633	45,391	1,630,111	3,010,067	3,643,684
Arkansas	1,913	6,301	8,224	258,607	846,339	1,102,270
California	3,155	7,091	8,104	401,414	886,501	1,026,474
Colorado	150,132	373,884	460,916	16,877,589	40,827,438	50,848,795
Connecticut	3	12	15	-	1,125	1,446
Delaware	-	61	199	-	6,551	21,078
Florida	1,031	2,195	2,815	82,544	175,303	225,237
Georgia	4,275	9,716	12,177	475,163	1,091,351	1,371,349
Idaho	18,314	41,439	50,944	2,816,102	5,994,132	7,293,626
Illinois	31,855	84,808	184,499	3,862,354	10,314,861	22,638,083
Indiana	8,344	25,108	51,844	1,050,649	3,127,856	6,428,379
Iowa	27,049	148,287	245,941	3,453,978	18,885,378	31,978,889
Kansas	215,599	401,692	477,008	24,811,633	46,187,256	54,983,249
Kentucky	13,010	27,625	38,382	1,454,631	3,057,660	4,238,639
Louisiana	3,606	13,860	20,300	426,582	1,642,787	2,406,122
Maine	608	1,184	1,229	-	72,476	75,190
Maryland	82	321	595	8,570	33,687	63,259
Michigan	5,338	14,504	37,341	615,261	1,648,901	4,274,679
Minnesota	72,332	219,770	287,544	8,763,291	26,526,190	34,825,865
Mississippi	35,982	88,112	107,160	3,867,469	9,440,913	11,469,868
Missouri	87,082	236,603	308,881	9,484,816	25,434,772	33,266,428
Montana	8,833	19,682	25,324	943,568	2,195,140	2,829,762
Nebraska	103,732	233,829	294,017	12,793,877	28,566,576	36,090,517
New Jersey	144	211	314	14,166	20,438	30,319
New Mexico	28,232	47,623	49,166	3,662,443	6,106,810	6,307,408
New York	1,366	3,093	5,246	146,565	333,558	566,568
North Carolina	3,598	6,549	8,635	285,605	516,264	684,895
North Dakota	89,020	262,840	315,390	7,850,265	23,705,108	28,644,065
Ohio	4,446	14,398	40,859	559,094	1,797,119	5,108,286
Oklahoma	13,099	24,905	29,578	1,506,404	2,857,971	3,345,574
Oregon	8,850	15,507	19,567	1,416,852	2,345,196	2,995,728
Pennsylvania	573	998	1,503	55,746	96,996	145,328
South Carolina	7,824	18,924	21,134	584,983	1,412,888	1,574,256
South Dakota	66,197	174,984	225,024	6,416,179	17,139,744	22,259,118
Tennessee	9,359	16,252	28,937	971,019	1,671,808	2,980,314
Texas	113,599	236,786	290,828	13,629,304	28,965,680	35,487,863
Utah	2,261	5,456	5,888	303,767	697,905	751,890
Vermont	16	16	16	-	-	-
Virginia	1,393	2,706	3,915	116,082	221,787	321,069
Washington	10,249	36,347	62,215	1,776,256	5,120,596	8,822,444
West Virginia	18	27	36	1,863	2,803	3,638
Wisconsin	29,285	72,391	117,374	3,527,831	8,689,127	14,077,621
Wyoming	7,783	16,077	16,796	969,851	1,950,479	2,035,190

increasing their production by over 40 million bushels. By 2014, 12 states will increase corn production by 10 million bushels or more. While the Great Plains states are the biggest gainers, Corn Belt states, such as Iowa and Illinois, will also see sizable corn production shifts with the release of CRP lands.

Based on USDA's World Ag Supply and Demand Estimates reports for the 2011 crop year, the average expected change in corn prices due to a 100 million bushel increase in corn ending stocks is a price drop of 32.5 cents per bushel. Thus, holding demand constant, the projected increases in corn production from Scenario 1 would lower corn prices by 45 cents in 2012, $1.08 in 2013, and $1.45 in 2014. However, demand is likely to shift higher mitigating some of this price impact. Futures prices at the time (January 5, 2012) pointed to season-average corn prices of $5.96 per bushel for the 2011 crop, $5.63 for 2012, $5.41 for 2013, and $5.44 for 2014. We observe that the market has already factored in some additional corn production in the coming years, bringing down corn prices 33 cents for 2012, 55 cents for 2013, and 52 cents for 2014. Using the price changes suggested by our model and factoring in the price path already shown in the futures market, the additional corn from expired CRP lands could bring projected 2012 corn prices down another 10-15 cents in the $5.50 range. Projected corn prices for 2013 would settle in the $5 range, while projected 2014 corn prices would approach $4.50.

As with any analysis of this type, the results are tied to the correctness of the assumptions. Scenario 1 was performed before we received all of the data necessary for the full analysis. To proceed with the analysis, we assumed that the grassed CRP land was evenly distributions across the U.S. This scenario provided a relative guide as we examined the later scenarios, utilizing additional CRP, soil, and yield data. Data received later revealed that the grassed CRP lands are more highly concentrated in the Great Plains. This change will likely have a significant impact as we examine the results from the remaining scenarios.

Set-up for Scenarios 2 through 4

For the next three scenarios, we combined CRP data from USDA-FSA with soil and yield data from the Soil Survey Geographic (SSURGO) database of USDA-NRCS, yield data from USDA-NASS, and erodibility index data from the 1997 National Resources Inventory (NRI) database of USDA-NRCS. The CRP data include CRP grassland acreage by survey number and soil map unit. The survey number indicated the state and usually the county of the land (in most cases, the survey number is the county FIPS code). When the survey number was not a county FIPS code, the resulting acreage and production results were distributed throughout the state based on the county's percentage of state-level CRP land in 2010 (the last year of full detail for publicly available county CRP data). Table 4 outlines the geographic distribution of CRP grassland among the lower 48 states. Colorado, Kansas, Montana, North Dakota, Texas, and Washington all have over 1 million acres in grassed CRP land. Thus, the Central Plains will be the focal point for any release of CRP grasslands.

As the CRP data were aggregated by survey number and soil map unit, the totals for each state will not add up to the total CRP grassland in the state. The CRP soil records only capture the top 3 major soils in the CRP parcel. Thus, if a parcel has more than 3 soil types, the acreage data provided to us will only capture the acreage for the top 3 soils on that parcel.

Table 4. CRP Grassland Acres by State

Alabama	75,704	Nebraska	593,471
Arkansas	25,137	New Jersey	1,170
California	87,388	New Mexico	406,887
Colorado	1,969,440	New York	26,140
Connecticut	80	North Carolina	11,013
Delaware	526	North Dakota	1,404,368
Florida	2,377	Ohio	128,257
Georgia	6,164	Oklahoma	760,565
Idaho	551,374	Oregon	452,476
Illinois	417,996	Pennsylvania	10,533
Indiana	114,095	South Carolina	8,598
Iowa	634,688	South Dakota	453,400
Kansas	1,730,869	Tennessee	114,799
Kentucky	145,333	Texas	3,082,695
Louisiana	10,927	Utah	147,458
Maine	13,802	Vermont	52
Maryland	4,637	Virginia	11,769
Michigan	109,380	Washington	1,143,044
Minnesota	667,678	West Virginia	509
Mississippi	75,456	Wisconsin	210,725
Missouri	978,114	Wyoming	181,031
Montana	2,203,654		

Lining up the SSURGO database with the CRP data was somewhat of a challenge. Each state can set up its own code structure for soil map units. Thus, two states can use the same soil map unit code for two different soils. One of the goals in creating the SSURGO database is to provide a consistent national soil map unit coding structure. And while much progress has been made, we did find that some of the soil map unit codes in the CRP data did not exactly match the codes listed in the SSURGO database. For those codes that matched exactly, we could obtain the crop yields listed for the county-soil combination in the database. We then followed a three step process to match crop yields to the county-soil combinations without an exact match. First, we searched the SSURGO database to see if the state-soil combination existed. If so, then we assigned the average crop yield from the state-soil combination to the listed county-soil combination. Second, if the state-soil combination was not in the SSURGO database, then we examined the yields listed for all county-soil combinations for the county and assigned the lowest crop yield listed in the database for the county to the listed county-soil combination. Third, for the CRP data that did not include county information, we assigned crop yields based on the lowest crop yield listed in the database for the state. Some states had zeroes for the lowest crop yields. For those states, we computed the average ratio of the lowest (non-zero) crop yield by state to the 10-year average USDA-NASS reported yield across all of the states in the study and used the product of that ratio times the state's 10-year average USDA-NASS reported yield to set the county-soil combination crop yield. We followed these procedures to arrive at what we consider conservative estimates of potential crop yields from the CRP grassland.

The other major piece of information we required is the Erodibility Index (EI) for the grassland. Again, the CRP data is aggregated to the county-soil combination. So the aggregation will contain areas with different characteristics, including different EIs. As with the crop yields, our approach assigns an EI to each county-soil combination in a consistent and conservative way, resulting in a bias towards higher EIs. The 1997 NRI database contains EI estimates for 800,000 sample sites across the U.S. Using the same approach as we had with the SSURGO database, we directed matched the CRP county-soil combinations to the NRI database. In many cases, there were multiple matches as the same county-soil combination appeared at several sample sites. For those direct matches, we multiplied the county-soil combination acreage by the proportion of sample sites at each EI level and assigned that EI level to the resulting acreage. So for example, if the county-soil combination for Story County, Iowa and soil map unit 95 has 8 NRI sample sites where 6 sites had an EI of 1.7 and 2 sites had an EI of 2, then 87.5% of the acreage for county-soil combination for Story County, Iowa and soil map unit 95 is assigned an EI of 1.7 and 12.5% of the acreage is assigned an EI of 2. However, as with the crop yields, the matching between the CRP data and NRI database was not perfect. There were some non-matches. In those cases, we computed the total acreage in the county at each EI level based on the proportion of sample sites as outlined above and assigned the highest EI level to the CRP acreage. If the CRP acreage exceeded the total acreage at that EI level, we assigned the remaining CRP acreage to the next highest EI level. And so on, until we exhausted the CRP acreage. For the CRP data that did not include county information, we followed a similar procedure. We computed the total acreage in the state at each EI level based on the proportion of sample sites as outlined above and assigned the highest EI level to the CRP acreage. If the CRP acreage exceeded the total acreage at that EI level, we assigned the remaining CRP acreage to the next highest EI level. And so on, until we exhausted the CRP acreage.

These procedures, when we could not achieve a direct match, will assign a higher EI level than might be correct for the land, but given the dual targets of this study, such a result would imply keeping more land in the CRP. Table 5 outlines the breakdown of the CRP grassland by EI that we obtained. These results show that there is significant potential for some CRP grassland to come back into production, while still protecting highly erodible land. We chose to examine three EI levels for the analysis. The 1996 early-out program used an EI of 15. An EI of 8 or higher is considered highly erodible land. And there has been some discussion of using an EI of up to 20 for early-out provisions.

Table 5. CRP Grassland by Erodibility Index

Erodibility Index	CRP Grassland Acres
Less than 8	7,752,759
8 to 15	3,375,316
15 to 20	1,379,889
Greater than 20	6,465,816

Note: Estimated

As we did with Scenario 1, we assume this land would be farmed like surrounding cropland. We examined county acreage availability from CRP, state-level cropping patterns in 2011, relative forward-looking crop pricing patterns from futures, and average CRP rental rates for the county, to determine the percentage of the expiring grassed CRP land that would enter corn production. Unlike in scenario 1 where CRP renewals could not take place, scenarios 2 through 4 allow for contract renewals by comparing returns to crop production with CRP rental rates to partially determine, along with the other criteria, whether eligible lands will renew or return to production. We assumed a normal harvesting rate of 91% of the acreage, based on recent national data. As before, this direct impact is not the only impact though. While corn captures a significant portion of the expired CRP lands, other crops, especially wheat, capture more. This crop acreage shift causes a rebalancing of croplands outside of CRP, with wheat gaining most of the CRP land and former wheat area outside of CRP shifting to corn. As we would expect this shift to have a greater impact in higher corn producing regions, we based the shift on the relative trend yields for corn by county across the state. Counties with higher corn trend yields have a larger proportion of their area move to corn. As the land we are discussing here is already in crop production, we do not discount the corn yield potential from the county trend.

Scenario 2: Allowing Early Release of CRP Lands under 1996 Rules

Figures 10 and 11 show the additional corn acreage and production – both direct and indirect – that results from allowing CRP grassland with an EI of less than 15 to opt out. Table 6 provides the state-level details. As Table 5 displayed, roughly 11 million acres would be eligible for release under the 1996 rules. Our analysis shows that nearly 4 million acres of land would shift to corn from both inside and outside of CRP. As the figures show, most of the action occurs in the Southern Plains as the greatest number of CRP grassland acres are located there. But there would also be significant shifting across the Corn Belt and Southeast.

Figure 10. Corn Acreage Shifts with Early Release of CRP Grasslands with EI < 15

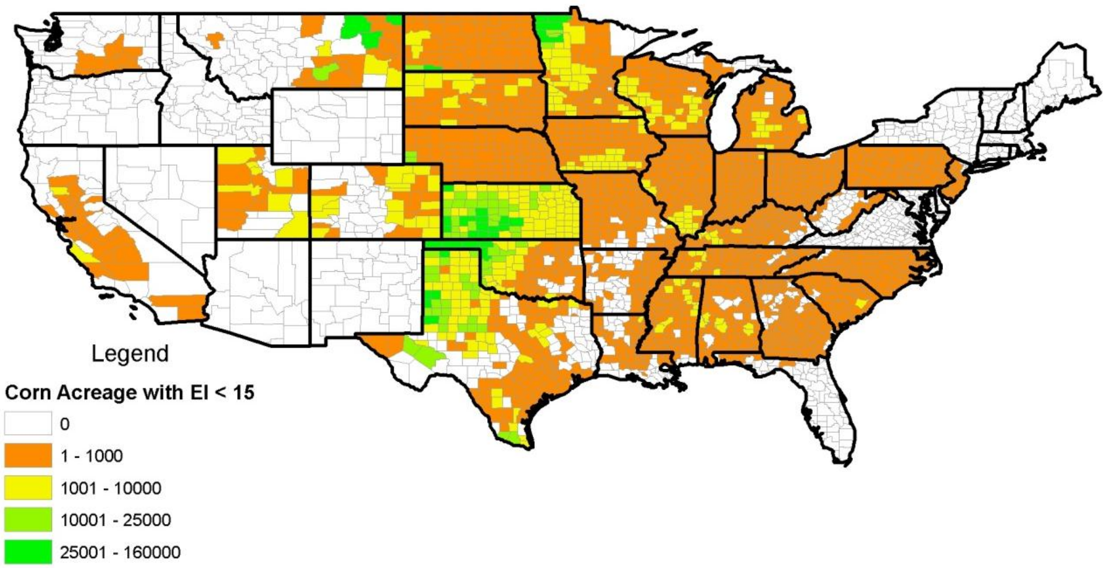
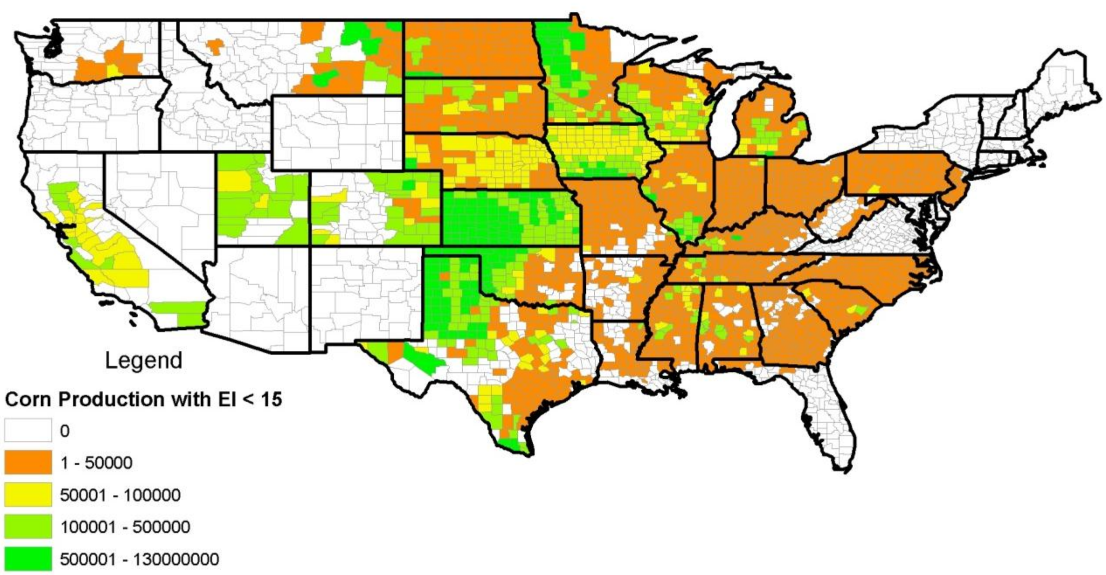


Figure 11. Corn Production Shifts with Early Release of CRP Grasslands with EI < 15



Overall, 3.8 million acres would move to corn, producing an additional 325 million bushels. Kansas, Texas, and Oklahoma would lead the charge. But Minnesota, Iowa, and Illinois are also in the top 10. One somewhat surprising result is in Missouri. There is a sizable portion of CRP grassland there, but the CRP rental rates were high enough to be competitive with crop returns. In total, the shift in corn acreage is roughly comparable to the increase in corn area this year. However, more of the acreage would be coming from more marginal corn areas. Thus, the production impact is not as strong. A greater release of CRP acres translates into relative lower prices and less incentive for non-CRP lands to shift.

Table 6. Total Additional Corn Production Shifts with CRP Release (EI < 15)

State	Acres	Bushels	State	Acres	Bushels
Alabama	24,240	1,802,812	Nebraska	34,244	1,678,040
Arkansas	4,478	372,236	New Jersey	50	2,976
California	7,354	404,494	New Mexico	0	0
Colorado	27,333	1,517,460	New York	0	0
Connecticut	0	0	North Carolina	52	2,620
Delaware	0	0	North Dakota	67,165	2,417,930
Florida	912	69,204	Ohio	4,583	475,806
Georgia	750	41,329	Oklahoma	618,498	52,572,356
Idaho	0	0	Oregon	0	0
Illinois	55,653	7,058,234	Pennsylvania	586	66,142
Indiana	3,960	513,687	South Carolina	7,314	678,209
Iowa	94,738	15,386,985	South Dakota	34,947	2,213,369
Kansas	1,162,256	104,603,148	Tennessee	18,346	1,698,526
Kentucky	26,649	3,629,983	Texas	834,385	60,424,936
Louisiana	3,191	272,836	Utah	0	0
Maine	0	0	Vermont	0	0
Maryland	0	0	Virginia	0	0
Michigan	39,485	4,402,593	Washington	1,021	65,325
Minnesota	366,640	40,108,234	West Virginia	109	8,505
Mississippi	30,632	2,505,798	Wisconsin	45,334	5,268,524
Missouri	3,316	345,529	Wyoming	0	0
Montana	327,029	14,389,290			

Scenario 3: Allowing Early Release of CRP Lands with Erodibility Indices < 20

Figures 12 and 13 show the additional corn acreage and production – both direct and indirect – that result from allowing CRP grassland with an EI of less than 20 to opt out. Table 7 provides the state-level details. As Table 5 shows, this change in the EI could allow an additional 1.4 million acres to leave the CRP. Our analysis indicates roughly 400,000 additional acres of land would shift to corn from both inside and outside of CRP. As with Scenario 2, most of the action occurs in the Southern Plains as the greatest number of CRP grassland acres are located there. But there would also be significant shifting across the Corn Belt and Southeast.

Figure 12. Corn Acreage Shifts with Early Release of CRP Grasslands with EI < 20

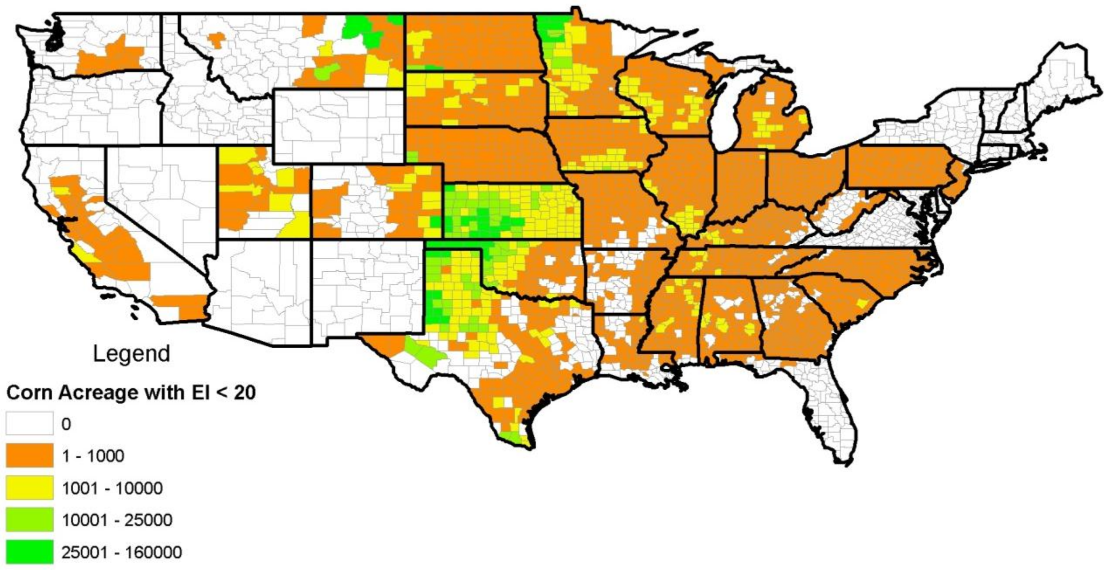
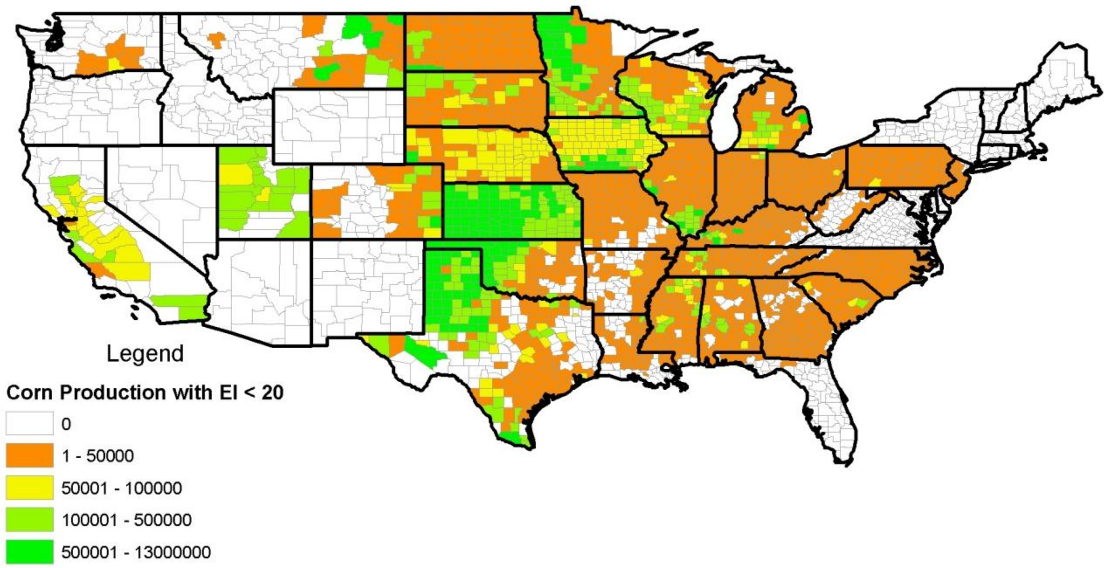


Figure 13. Corn Production Shifts with Early Release of CRP Grasslands with EI < 20



Overall, 4.2 million acres would move to corn, producing an additional 354 million bushels. So, the increase of the EI threshold to 20 captures the potential for an additional 29 million bushels. The spatial pattern of the acreage and production is very similar under the two scenarios.

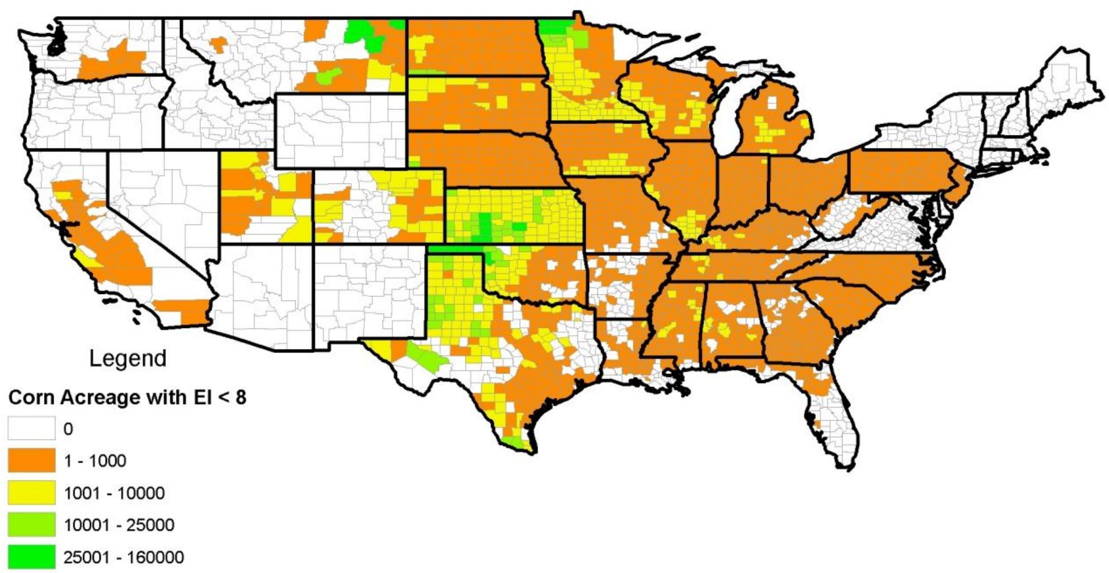
Table 7. Total Additional Corn Production Shifts with CRP Release (EI < 20)

State	Acres	Bushels	State	Acres	Bushels
Alabama	25,504	1,897,707	Nebraska	35,060	1,718,019
Arkansas	4,685	391,647	New Jersey	83	4,959
California	8,439	464,167	New Mexico	0	0
Colorado	97,484	5,725,941	New York	0	0
Connecticut	0	0	North Carolina	56	2,806
Delaware	0	0	North Dakota	69,227	2,492,185
Florida	912	69,204	Ohio	4,649	482,471
Georgia	753	41,505	Oklahoma	654,497	55,632,259
Idaho	0	0	Oregon	0	0
Illinois	57,566	7,297,089	Pennsylvania	607	68,600
Indiana	3,961	513,781	South Carolina	7,455	690,717
Iowa	106,241	17,092,776	South Dakota	35,418	2,240,648
Kansas	1,260,324	113,429,195	Tennessee	19,170	1,768,908
Kentucky	29,155	3,975,102	Texas	980,727	69,620,642
Louisiana	3,272	279,721	Utah	0	0
Maine	0	0	Vermont	0	0
Maryland	0	0	Virginia	0	0
Michigan	41,068	4,588,256	Washington	1,021	65,325
Minnesota	371,571	40,681,724	West Virginia	113	8,823
Mississippi	31,815	2,605,747	Wisconsin	48,265	5,617,292
Missouri	3,545	370,383	Wyoming	0	0
Montana	332,956	14,650,049			

Scenario 4: Allowing Early Release of CRP Lands with Erodibility Indices < 8

Figures 14 and 15 show the additional corn acreage and production – both direct and indirect – that result from allowing CRP grassland with an EI of less than 8 to opt out. This would restrict the early-out provisions to non-highly erodible lands. Table 8 provides the state-level details. As Table 5 shows, this change in the EI could allow up to 7.75 million acres to leave the CRP. Our analysis indicates roughly 2.6 million acres of land would shift to corn from both inside and outside of CRP. As with the other scenarios, most of the action occurs in the Southern Plains as the greatest number of CRP grassland acres are located there. Here, the change in the EI threshold has a noticeable impacts on the maps as less acreage is available from the CRP and more shifting occurs outside of CRP.

Figure 14. Corn Acreage Shifts with Early Release of CRP Grasslands with EI < 8



Overall, 2.6 million acres would move to corn, producing an additional 220 million bushels. Thus, we see marginal production decreases as we change the EI threshold. The EI shift from 8 to 15 nets approximately 800,000 more acres and 105 million bushels of production. The shift from 15 to 20 gains an additional 400,000 acres and 29 million bushels of production. In comparison to Scenario 1, the additional detail on CRP lands had two distinct impacts. More land is possibly available to bring into corn production, but that land has lower potential yields and production.

Figure 15. Corn Production Shifts with Early Release of CRP Grasslands with EI < 8

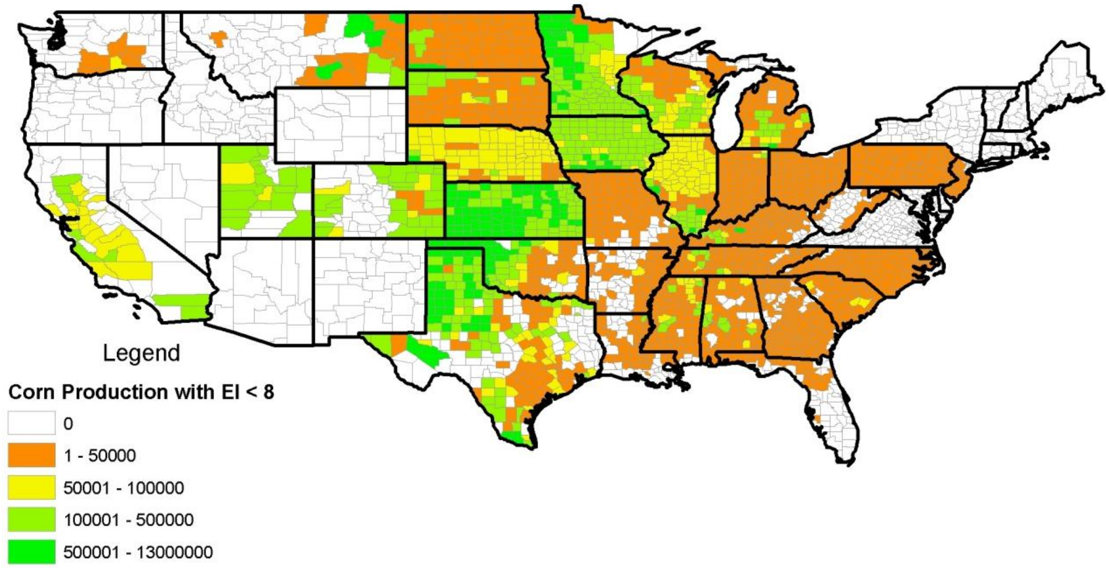


Table 8. Total Additional Corn Production Shifts with CRP Release (EI < 8)

State	Acres	Bushels	State	Acres	Bushels
Alabama	20,964	1,560,323	Nebraska	26,124	1,280,089
Arkansas	4,214	349,061	New Jersey	47	2,794
California	6,892	379,059	New Mexico	0	0
Colorado	18,609	1,032,813	New York	0	0
Connecticut	0	0	North Carolina	51	2,557
Delaware	0	0	North Dakota	41,611	1,498,011
Florida	883	67,414	Ohio	4,187	433,438
Georgia	674	36,712	Oklahoma	480,288	40,824,505
Idaho	0	0	Oregon	0	0
Illinois	46,053	5,852,319	Pennsylvania	550	61,936
Indiana	3,940	510,845	South Carolina	6,732	628,230
Iowa	76,314	12,425,099	South Dakota	26,134	1,600,951
Kansas	635,696	57,212,683	Tennessee	16,263	1,519,910
Kentucky	22,073	2,987,539	Texas	570,645	40,556,615
Louisiana	3,078	262,954	Utah	0	0
Maine	0	0	Vermont	0	0
Maryland	0	0	Virginia	0	0
Michigan	35,832	4,002,934	Washington	1,021	65,325
Minnesota	264,359	29,356,778	West Virginia	106	8,298
Mississippi	27,740	2,277,706	Wisconsin	40,140	4,642,807
Missouri	2,740	287,257	Wyoming	0	0
Montana	189,996	8,359,815			

Price Impacts

As with the analysis for Scenario 1, we will base price impacts using the relationship indicated from USDA's World Ag Supply and Demand Estimates reports for the 2011 crop year. For 2011, the average expected change in corn prices due to a 100 million bushel increase in corn ending stocks is a price drop of 32.5 cents per bushel. Thus, holding demand constant, the projected increases in corn production from Scenarios 2 through 4 would lower corn prices by 72 to 115 cents. However, demand is likely to shift higher mitigating some of this price impact.

Table 9. Summary with Price Impacts

	Acres	Bushels	Price Impact
EI < 8	2,573,958	220,086,779	-0.72
EI < 15	3,845,251	324,997,115	-1.06
EI < 20	4,235,601	354,487,648	-1.15

Futures prices at the current time (June 26, 2012) pointed to season-average corn prices of $5.84 per bushel for the 2012 corn crop, $5.35 for 2013, and $5.01 for 2014. So the market has already factored in some addition corn production in the coming years and brought corn prices down 49 cents for 2013 and 83 cents for 2014. Using the price changes suggested by our model and factoring in the price path already shown in the futures market, the additional corn from expired CRP lands could bring projected 2013 corn prices down another 23-66 cents, depending on the EI threshold. That would put 2013 corn prices in the $4.70-5.12 range, while projected 2014 corn prices would approach $4.50. So the price impacts are very similar to what we found in the 1st scenario.

In summary, the four scenarios had similar outcomes. Corn acreage and production went up by at most five percent. In the short-term, corn prices would be lower. But longer run, the expected corn price stabilized around $4.50 per bushel. Most of the acreage gain was outside the traditional Corn Belt, which translated into smaller production gains for the given acreage.