



# ECONOMICS COMMENTATOR

South Dakota State University

No. 557

November 20, 2015

## FARMLAND USE DECISIONS IN THE DAKOTA'S: KEY RESULTS FROM THE 2015 PRODUCER SURVEY



by  
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### Introduction

This newsletter is written to summarize the major findings from the 2015 survey on farmland use decisions in the Dakotas which was completed by 1,026 producers located across 57 counties in South Dakota and North Dakota. We wish to thank each person that completed this survey in March or April of 2015. We are sending this newsletter to their household as our “thank you” for participating. The key findings should be of general interest to a wider audience and the following content is written for this purpose.

### Background and Purpose

For many decades, land use change between crop and grass cover has been prominent in the Prairie Pothole regions (PPR) of North and South Dakota. Since 1985, producers in both states have been major users of the Conservation Reserve Program (CRP) converting millions of cropland acres into grassland habitat. In more recent times, from 2006 to 2011, cropland enrolled in CRP decreased from 5.0 million to 3.8 million acres in the Dakotas with most of the post-CRP tracts converted back to cropland use (Feng, Hennessy, and Miao, 2013). During this same time period, there has also been considerable conversion of native grassland and

tame grassland to cropland use, especially to corn and soybeans, in the PPR of both states (Wright and Wimberley, 2013; Reitsma et.al. 2014).

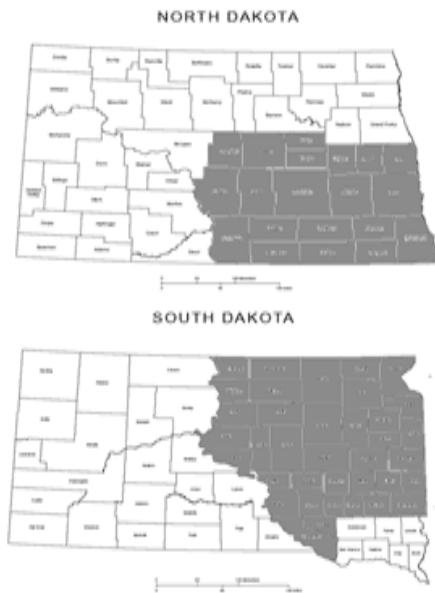
Most recent studies have used various federal agricultural and conservation program databases, U.S. Census of agriculture statistics or satellite remote sensing techniques to estimate land use conversion and cropland use change. This study uses a 2015 Farmland Use Decision survey of producers and landowners in the Dakotas to obtain data on their: (1) recent and projected agricultural land use patterns, (2) land use conversion (grass to crop or crop to grass), and (3) views on the main drivers of land use change or conversion. The perspectives of agricultural producers are especially important if we wish to understand the dynamics of land use change and the major factors influencing these principal decision makers.

The study region consists of 37 counties in South Dakota and 20 counties in North Dakota located in the PPR where: (1) corn, soybeans and wheat are the dominant crops, and (2) considerable land use change and land use conversion has occurred in the past 10 – 20 years (figure 1). The mail survey was conducted in March and April, 2015. Data collected from 1,026 producer respondents (36% response rate) are the basis of this study (Luri, 2015).

Survey respondents were most representative of full-time farmers with no off-farm employment and who were not retired (87% of sample) and farms with at least \$50,000 of gross farm sales and more than 260 acres operated (95% of sample).

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**Figure 1: Study Region in North Dakota and South Dakota**



### Land Use Change and Conversion

Respondents provided considerable information on land use change and conversion decision made in the past 10 years. Key findings are listed below.

1. The average farm size per respondent was 1,206 cropland acres and a total of 1,686 acres operated. Most of the remaining acres were tame or native grassland. Almost all producers had some cropland, while three-fourths also had some pasture or rangeland.
2. Farmers in the study region operated more acres of cropland compared to 10 years earlier. Nearly 90% of respondent producers raised corn and/or soybeans each year during the past 10 years. Corn and soybean acres have also increased on a majority of the farms in this time period. Nearly half of North Dakota respondents raised wheat each year compared to only 28% in South Dakota. Very few (<5%) respondents in each state increased their wheat acres compared to other crops. Nearly half of respondent producers adopted or increased their use of no-till crop systems.
3. Most producer respondents in both states perceived that grassland acreages within their local area (less than a five mile radius from their farm headquarters) have

- decreased in the last 10 years, while corn and soybean acres have increased.
4. Infrastructure to support production and marketing of specific crops or livestock is very important in assessment of regional land use change. Most producers indicate that infrastructure to support corn or soybean production in their locality had greatly increased, while infrastructure to support wheat or cattle production has not changed substantially in the past 10 years. The average road distance from their farm to an elevator that accepts corn, wheat, or soybeans was 10 to 12 miles. The average distance from the nearest ethanol plant was 34 miles in SD and 62 miles in ND.
5. During the past 10 years, the grass to crop conversion rates (as percent of 2014 cropland acres operated) was 7.2% in both states, with more CRP grass conversion in North Dakota and tame / native grass conversion in South Dakota. Grassland to cropland conversion was more common in the central regions of both States, compared to the eastern regions. Most of the converted grassland was planted to corn or soybeans.
6. There was also some conversion from crop to grass, primarily related to new CRP or WRP (Wetland Reserve Program) enrollment or post-CRP land use remaining in grass for hay, grazing or wildlife habitat. Most of the crop to grass conversion is also occurring in the central regions of both states. Overall, the net conversion rate of grassland to cropland was 4.9% of 2014 cropland acres.
7. The dynamics of land conversion are strongly reflected in the extent of producer participation. More than half (54%) of respondents were involved in one or more land use conversion decisions implemented in the past 10 years. Nearly 14% of respondents were involved in both conversion of grassland to cropland and conversion of cropland to grassland cover. Another 14% were only involved in converting cropland to grassland cover, primarily new CRP enrollment. Finally, 26% of respondents were only involved in converting grassland to cropland during the previous 10-year period.

8. Overall, forty percent of respondents had converted some grassland to cropland use in the past 10 years. For these respondents, the extent of converted grassland averaged 13 – 14% of their 2014 cropland acres. Based on survey results, land use conversion decisions in the study regions were more likely made by respondents with the following characteristics: 1) those who expanded their land operation, in terms of acres operated during the past 10 years, 2) those who currently operate more than 2000 acres and have gross farm sales exceeding \$500,000, and 3) those who are currently less than 50 years old. Grass to crop conversion decisions were much less likely to have been made by operators of smaller size farms, by farmers more than 60 years old, and by those farmers who had downsized their operation, in terms of acres operated, in the past 10 years.

4. More efficient crop equipment, pest management practices and crop insurance factors were the next items listed. The other factors in the list including labor availability problems, availability of drought tolerant seed, and improving wildlife habitat were not often ranked as important in most of their land use decision making. An exception is that “improving wildlife habitat” was ranked high by those converting some cropland tracts to wildlife compatible uses of crops, grass and shrubs.

Additional analysis examined producer responses to the relative importance of each driving force in their land use decision making, using a 1 to 5 scale where 1=no impact and 5=great impact. Changing crop prices, changing input prices and improved crop yields easily remained the top three impact factors. However, changing weather and climate was ranked 7<sup>th</sup> in relative importance following crop / revenue insurance which was ranked 6<sup>th</sup>.

Overall, the main results from these sections of the survey highlight the widespread extent of producer participation in both changing land use patterns and land conversion occurring in the PPR. The other highlight is the importance of economic and technology factors on producer decisions concerning land use and land conversion.

**Key Findings – Driving Forces**

Respondents were asked to rank the relative importance of 10 different driving forces that affected their land use decisions, especially land use changes, in the past 10 years. Most of the driving forces can be grouped into economic, technology change, policy and environmental factors (table 1).

1. Changing crop prices was the most important driving force influencing land use decisions. One-half of all respondents indicated increased crop prices was the single most important factor behind their land use decisions, especially conversion decisions.
2. Changing input prices (for seed, fertilizer, chemicals etc.) and increased crop yields (for reasons other than seed traits) were the second and third most influential factors. These two factors were selected by a total of 26% of all respondents.
3. Changing weather and climate ranked 4<sup>th</sup> in terms of percent of respondents selecting this item as their most influential decision factor. However, only 6.9% of respondents selected this item as their most important decision factor. Based on respondent comments, this factor may reflect the extent to which some farmers encountered flood or drought issues.

**Table 1: Ranking farm related decision factors affecting land use changes**

Farm related decision factor:	Rank	% of respondents listing item as “most important”
Changing crop prices	1 <sup>st</sup>	50.3% of responses
Changing input prices (seed, fert., chem)	2 <sup>nd</sup>	15.2%
Improved crop yields	3 <sup>rd</sup>	10.8%
Changing weather / climate	4 <sup>th</sup>	6.9%
More efficient crop equipment	5 <sup>th</sup>	5.9%
Crop & revenue insurance	6 <sup>th</sup>	3.7%
Pest management practices	7 <sup>th</sup>	2.9%
Labor availability problems	8 <sup>th</sup>	2.6%
Improving wildlife habitat	9 <sup>th</sup>	1.9%
Availability of drought-tolerant seed	10 <sup>th</sup>	1.8%

## Future Land Use Plans

Finally respondents were queried about their future land use plans in the next 10 years and their expectations of land use changes in their neighborhood.

1. Comparatively few producers have plans to convert land use from grass to crop use or from crop to grass use in the next 10 years. For example, very few respondents (only 2.6%) plan to convert some native grassland to cropland and only 6.5% plan to convert tame grassland to cropland use in the next 10 years. Finally, about one-eighth (12.6%) of respondents have plans to convert some cropland to pasture or grassland in the next 10 years. Another 20% of respondents indicated that they “don’t know” about their future land use conversion plans at this time.
2. Most respondents did not expect major changes (greater than 5% of acres) in grassland acres in their locality in the next 10 years. Over two-thirds (68%) of respondents expected no major change in grassland acres, while 26% projected further decline in grassland acres, and 6% expected increased grassland acres. However, almost no respondents projected increases in native grassland acres in their neighborhood during the next 10 years.
3. Respondents were more divided on the direction of corn and soybean acres in their locality for the next 10 years. Overall, 61% of respondents expected stable amount corn and soybean acres, while 22% projected a 5 – 10% increase and 5% projected more than a 10% increase in corn and soybean acres. Conversely, 12% of producer respondents expect more than a 5% reduction in corn and soybean acres in their locality in the next 10 years.

Overall, producers project more land use stability in the next 10 years than in the past 10 years. This result is partly due to uncertainty about future crop and livestock prices, farm program provisions, renewable energy policies, agricultural technology

changes and other factors that affect land use decision making.

## Acknowledgements

Funding for this project was provided by the USDA – National Institute of Food and Agriculture, award # 2014-67003-21772 (Dr. David Hennessy, overall project director) and the SDSU Agricultural Experiment Station.

Appreciation is expressed to all North Dakota and South Dakota producers completing this survey and to the Iowa State University Survey Research Center personnel involved in survey management and data coding. Without your efforts this project would not be possible.

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