CAPITALIZING CONSERVATION

How CRP enrollment affects Kansas farmland values

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Introduction

- Farmland is a fundamental asset to the agricultural economy influencing
  - Land tenure decisions
  - Profitability
  - Rural development
- Key indicator of the sector's financial well-being
- It represents the largest share of farm-sector assets—over 80%
- Changes in farmland values affect farm ability to
  - Refinance or restructure farm debt

Introduction

CRP enrollment starts with a practical offer

Check eligibility

1

Land must meet cropping-history and environmental criteria and offer significant conservation benefits

Choose goals & practices

2

Provide land information, conservation goals, and the practices you want to establish

Submit an offer

3

Submit the completed offer to your local FSA office

Offer is considered

4

General CRP offers are ranked. Continuous CRP does not use competitive ranking for eligible land

Enrollment is voluntary. Continuous CRP acceptance depends on available acres and USDA priorities—and is not guaranteed

Introduction

Rental rate begins with local land and soil information

County cash rents

Reflect average cash rent for non-irrigated cropland in the county

Soil productivity

The soil types on the offered acres affect the maximum soil rental rate

The CRP offer

Together, local rent and soil information help determine the rate. In General CRP, a producer may accept less to improve competitiveness

Once accepted, the rental rate is generally fixed for the 10- to 15-year contract

Introduction

What CRP establishes and what It provides

CONSERVATION ACTION

Convert eligible land to long-term, resource-conserving vegetative cover

Examples named by USDA:
- Native grasses or trees
- Riparian buffers
- Filter strips or grass waterways

PROGRAM SUPPORT

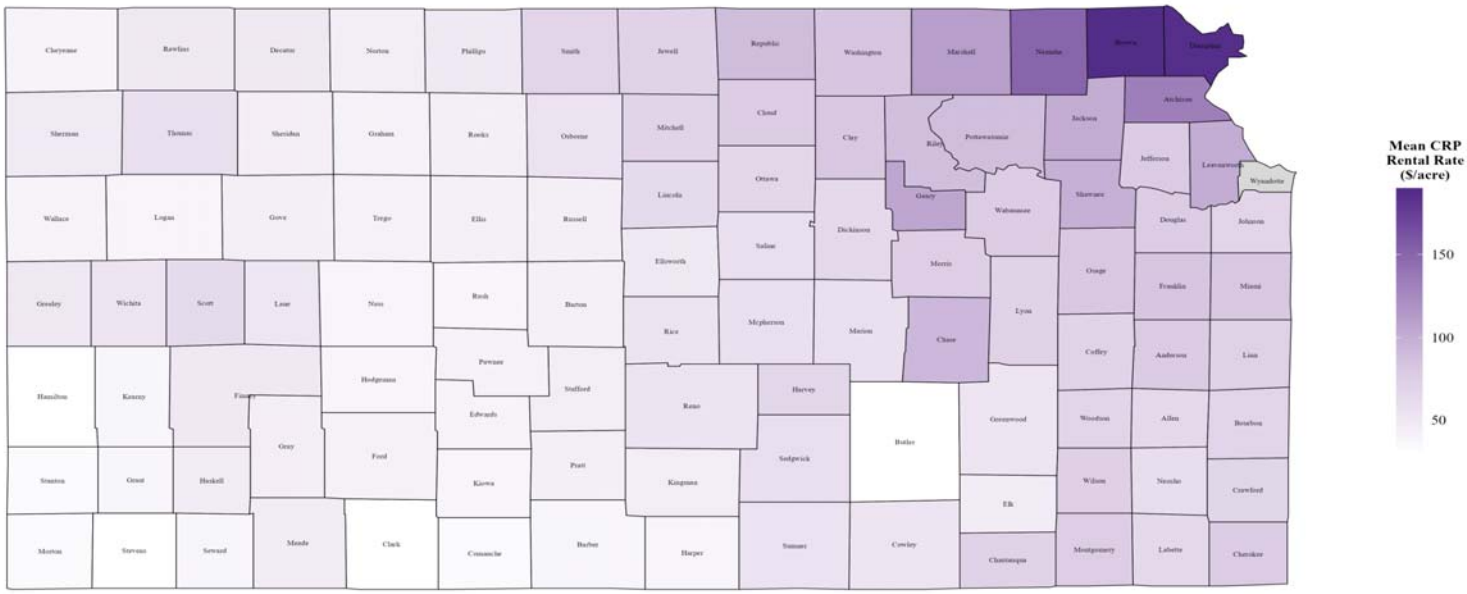
- Annual rental payments
- Up to 50% cost-share to establish approved conservation practices
- Contracts typically last 10 to 15 years
  - Penalties for early contract termination

Practical outcomes: • less soil erosion • better water quality • more wildlife habitat

Sampson et al.	Farmland Value Effects of CRP Enrollment

County-Level CRP Rental Rates in Kansas

Kansas average: $58.55/acre



Note: County rental rates are averaged across CRP observations within each county.

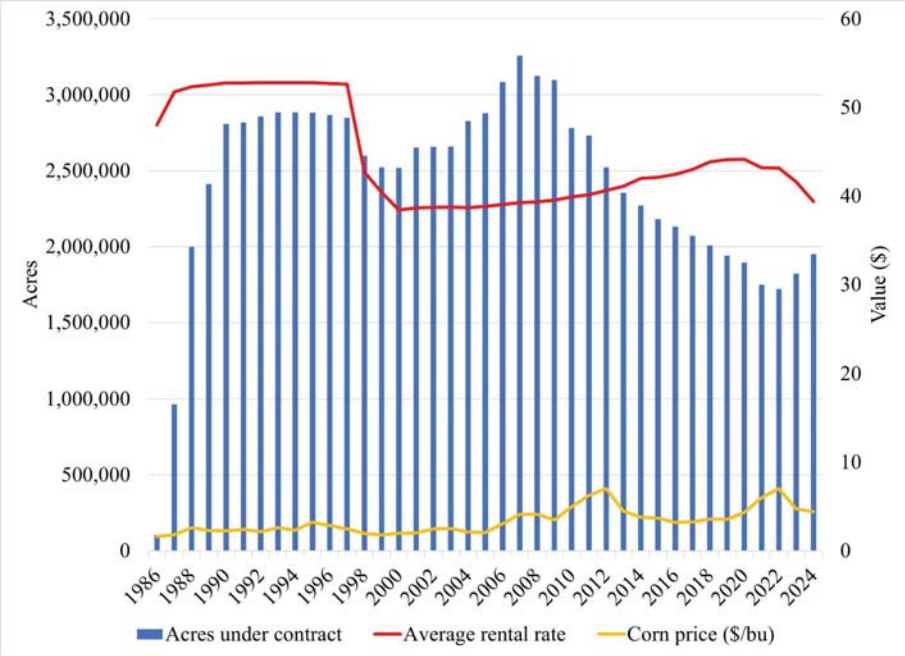
Introduction

- Land value impacts
  - Returns to farming change over time (commodity boom/bust)
    - CRP rental rate relative to market
  - Land use restrictions
  - Cost of conversion upon contract expiration (herbicides, yield drag)
  - Recreational demand (e.g., hunting lease payments)

Introduction

- Objective: uncover new evidence for how CRP enrollment affects farmland values
  - Unique aspects of this project:
    - Confidential CRP contract data at the common land unit (CLU)
      - CLU is a USDA definition of smallest unit of common land cover and ownership
      - Data provides enrolled acres, start/end dates, rental rate, and conservation practices
    - Can precisely match enrollment characteristics to land transaction using parcel boundary polygons
  - Examine how proportion enrolled in CRP affects land values, while controlling for rental rate and duration

CRP- Background



Method

- 30,800 farmland transactions from 2010 to 2024
  - 1,330 had active CRP contract (~4.4% of transactions)
- Merge geospatial CRP data to farmland transactions using parcel boundaries (CRP data span 2010-2024)
  - Acres under contract
  - Rental rate
  - Time remaining on contract
  - Conservation practice class (acres of each class)
- Hedonic price model of farmland

Method: Hedonic price model

A farmland sale price reflects a bundle of characteristics

THE LAND

- Soil quality
- Land use and acreage
- Weather conditions

MARKET CONDITIONS

- Location and year of sale
- Local corn prices
- Nearby market conditions

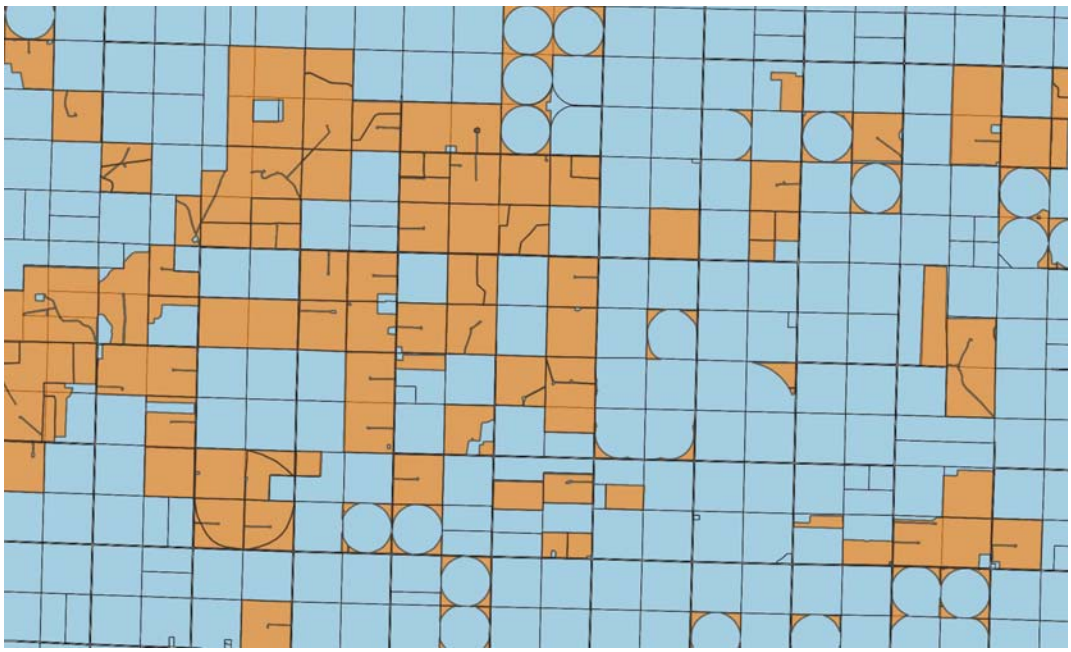
CRP CONTRACT

- Share of acres enrolled
- Annual rental rate
- Years remaining

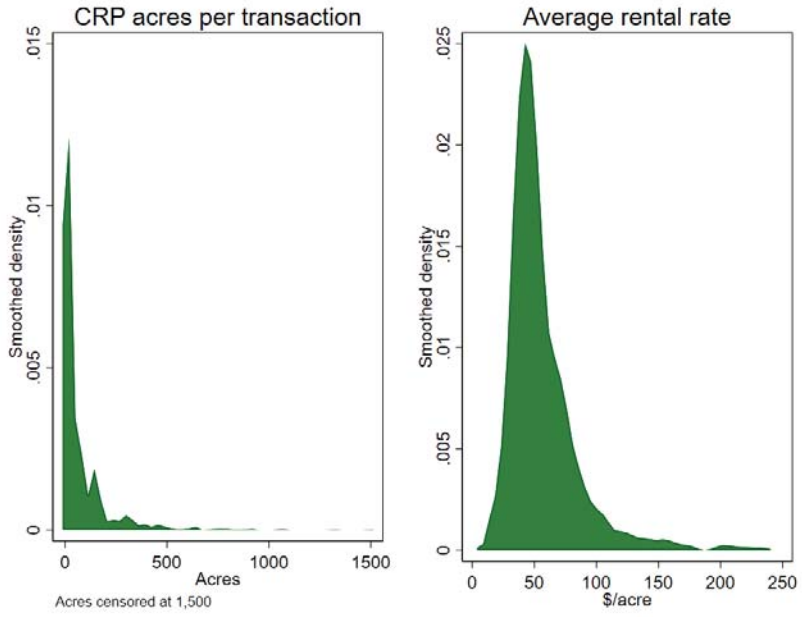
We compare similar farmland sales to isolate how the CRP contract is reflected in the sale price

Data-CRP locations and parcel boundaries

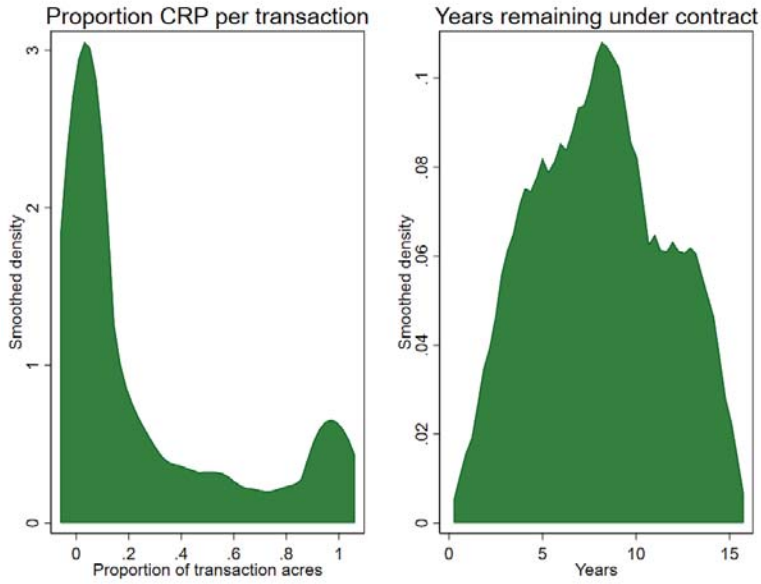
Data-CRP locations and parcel boundaries



Data-CRP contract attributes



Data-CRP contract attributes

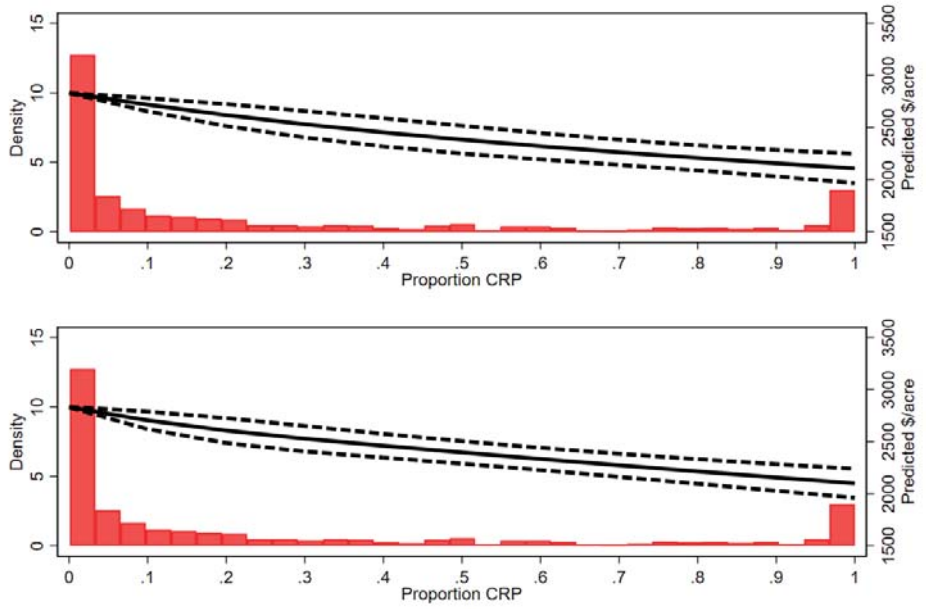


Data-summary statistics

	Non-CRP sale			CRP sale			
	n	mean	sd	n	mean	sd	Diff
Price per acre	29,002	2,890.457	1,821.782	1,324	2,213.608	1,532.766	-196.651***
Proportion native grass	29,002	0.388	0.388	1,324	0.275	0.321	-0.053***
Proportion tame grass	29,002	0.068	0.190	1,324	0.012	0.060	-0.011***
Proportion dry cropland	29,002	0.503	0.401	1,324	0.641	0.346	0.067***
Proportion irrigated cropland	29,002	0.042	0.171	1,324	0.073	0.220	-0.004
Average corn cash price ($/bu)	29,002	6.160	1.932	1,324	5.952	1.661	-0.002
Average water deficit (inches)	29,002	14.488	9.482	1,324	22.098	8.807	0.051
Average degree days > 34C	29,002	14.358	9.365	1,324	15.503	7.914	0.207***
Average degree days 10-34C	29,002	2,296.932	149.261	1,324	2,291.131	125.833	0.126*
Slope (%)	29,002	3.850	2.976	1,324	3.519	2.515	0.097
Sand soil (%)	29,002	20.383	18.952	1,324	26.364	21.415	0.334
Silt soil (%)	29,002	49.129	13.340	1,324	47.525	15.813	-0.116
Clay soil (%)	29,002	30.488	9.203	1,324	26.111	8.077	-0.218*
Soil organic carbon (kg/m^2)	29,002	9.348	3.141	1,324	7.741	2.880	-0.075
Number of parcels in transaction	29,002	1.452	1.793	1,324	1.717	1.855	0.207***

Note: The Diff columns is the coefficient of a regression of CRP status on the variable, with agricultural district-year and township controls and clustered standard errors at the agricultural district-year level.
*** p<0.01
** p<0.05
* p<0.10

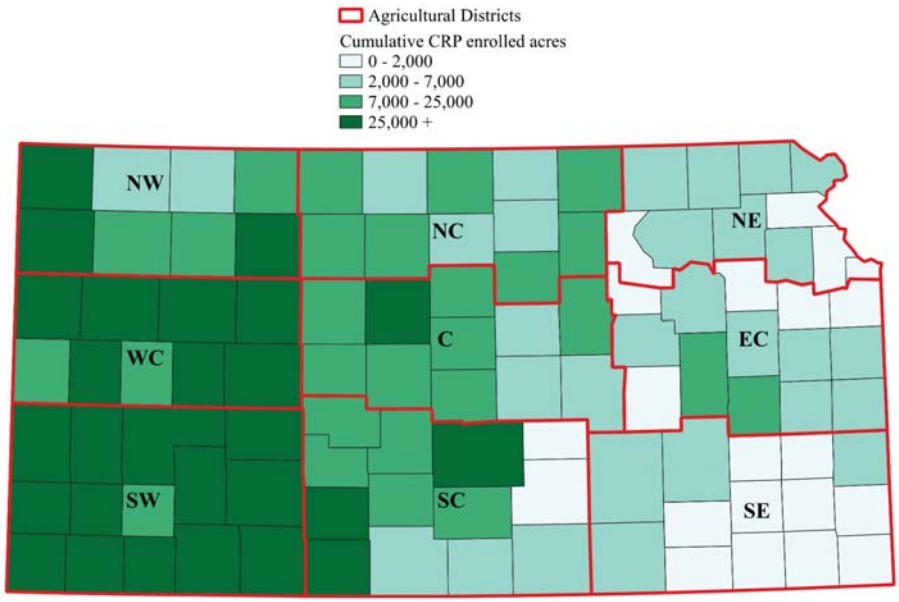
Results-nonlinear in CRP



Results-linear in CRP

- Enrolling 100% of acreage reduces value by about:
  - 27-28% on average
    - About $880-915/acre on average
    - Averages across land use types
  - Relative to full dryland: about 33% discount
  - Relative to grassland: about 15%
- "Average" case of a land transaction with CRP enrollment (25% of acreage enrolled in CRP)
  - 25% enrollment = 7% market discount (-$220/acre)
  - Additional $1/acre CRP rental rate = +$2/acre market value
  - Additional 1 year under contract = -$14/acre market value
    - Reflects delayed re-entry into agricultural production

Results-spatial heterogeneity



Results-spatial heterogeneity

	Proportional effect	Level effect	Obs.	CRP sales
NW District	-28%***	-753***	2,221	125
WC District	-33%***	-786***	1,885	199
SW District	-30%***	-666***	3,230	421
NC District	-21%***	-698***	3,357	95
C District	-32%***	-1077***	3,503	153
SC District	-32%***	-1030***	4,123	137
NE District	-36%	-220	2,842	42
EC District	+3%	+110	3,960	128
SE District	-15%	-405	5,096	29
Spatial Controls		County		
Temporal Controls		Year		
Rental rate?		Yes		
Time remaining?		Yes		
Number of contracts?		Yes		
Signup?		Yes		

Standard errors clustered at year
Also controls for: land cover, county-year cash corn price, weather, parcel-level soil characteristics, and county and year effects
*** p<0.01, ** p<0.05, * p<0.10

Soil regeneration?

- Carbon farming, regenerative agriculture
- USDA COMET-Planner predicts carbon sequestration by county, irrigation status, and NRCS conservation practice (https://comet-planner.com/)
- We link each CRP practice to its closest NRCS practice
  - Gives acre-year measure we can match to the planner
  - Predict the 91,000 acres of CRP transactions sequestered about 685,000 metric tons of CO2 equivalent
- How much does it cost to "store" carbon in soil through CRP practices? About $66 per metric ton

Discussion

- Enrolling small portions of a parcel into CRP has minimal land value penalty:
  - Corners of irrigated circles, riparian areas, etc.
  - 10% CRP enrollment → ~3% land market discount
- Eastern Kansas active recreational market?
  - Not many CRP transactions. Difficult to identify an effect. Maybe opposing influences?
- Contracts approaching retirement face lower discount
  - 7% greater market value for expiring contract relative to newly enrolled (assuming 25% CRP acreage)
- Observe 91,000 acres of CRP land transacted 2010-2024
  - Predict land values were $45 million lower due to CRP enrollment
    - $35,000 per transaction on average

Thank You!

We welcome your questions

Examples of CRP Conservation Practices

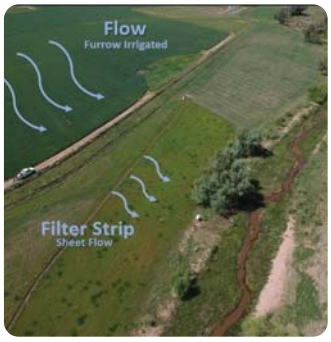
Vegetative covers and buffers named on USDA's CRP program page

Native grasses

Photo: USGS

Riparian buffer

Photo: USDA–NRCS



Filter strip

Image: Vernon County NRCS Guide

Grassed waterway

Photo: Penn State Extension

Sources

[1] Native grasses image: U.S. Geological Survey — https://www.usgs.gov/media/images/usda-conservation-reserve-program-crp-field-planted-pollinators
[2] Riparian buffer image: USDA–NRCS via Wikimedia Commons — https://commons.wikimedia.org/wiki/File:NRCSIA00042_(26982039492).jpg
[3] Filter strip image: Vernon County NRCS Guide — https://vernonbmpguide.ericbarefoot.com/bmp_pages/filter-strips.html
[4] Grassed waterway image: Penn State Extension — https://extension.psu.edu/grassed-waterways