

The Effects of CRP Participation on Later Land Use



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Research Question

- What effect does *having been in CRP* have on later land use for parcels that exit?
 - Farming or other use
 - Conservation practice adoption

Background: The CRP

- Began with 1985 Farm Bill
- Binding contracts for 10-15 years
 - Rental rate bid by farmer
 - Conservation practice undertaken
- Environmental goals vs. social goals
- Later modifications improved incentives, emphasized sensitive land
- 36.4 to 39.2 million acres enrolled 1992-2002

Existing Literature

- First contracts ended 1996
- Pre-1996: land use simulations, surveys
- Post-1996: updated simulations
- Without CRP, how much land would stay out of farming?
 - Lubowski, Plantinga, & Stavins (2003): 9.6%
 - De La Torre Ugarte & Helliwinckel (2006): 63%
 - Roberts and Lubowski (2007): 58%

Farm Outcome Analysis: Overview

- NRI data + Lubowski rent data
- Outcome: Farmed in 1997
- Treatment: CRP in 1992
- Population used:
 - Naïve specifications: large sample
 - Trimmed sample:
 - Only CRP land that could or did exit
 - Only non-CRP land most comparable to CRP land
 - High-quality land in trimmed sample
- Methods: OLS, logit, probit, matching (+IV)

Farm Outcome Results:

Naïve Specification (whole population)

Omitted category is non-farmed 1992 & non-CRP 1992 (regs 1 & 2)
/ non-CRP 1992 + CRP non-exiters (reg 3)

	Regression 1	Regression 2	Regression 3
CRP dummy	-0.362** (0.005)		
Early CRP dummy		-0.346** (0.005)	
Late CRP dummy		-0.389** (0.005)	
CRPEXIT dummy			0.313** (0.007)
FARM92 dummy	0.486** (0.005)	0.486** (0.005)	0.689** (0.003)
N (acres)	3332572	3332572	3332572
F	13192.18	16893.24	1830.67
R2	0.5449	0.5452	0.5121

- Matching with whole pop: $ATT = -0.738^{**}$
($SE=0.014$), robust all gammas up to 6 or more₆

Farm Outcome Results: Trimmed Populations

What CRP land included?	Exit 1992-7	Early signup wave	Exit 1992-7	Early signup wave
What non-CRP (previously farmed) land included?	All land	All land	Not farmed 1992	Not farmed 1992
OLS	-0.316**	-0.775**	0.231**	-0.185**
Logit (marginal effect)	-0.285**	-0.834**	0.275**	-0.219**
Probit (marginal effect)	-0.301**	-0.823**	0.266**	-0.224**
Matching	-0.305**	-0.712**	0.207**	-0.159**

Farm Outcome Results: High-Quality Land in Trimmed Populations

What CRP land included?	Exit 1992-7	Early signup wave	Exit 1992-7	Early signup wave
What non-CRP (previously farmed) land included?	All land	All land	Not farmed 1992	Not farmed 1992
OLS	-0.265**	-0.773**	0.274**	-0.186**
Logit (marginal effect)	-0.249**	-0.833**	0.333**	-0.221**
Probit (marginal effect)	-0.264**	-0.818**	0.318**	-0.224**
Matching	-0.310**	-0.735**	0.269**	-0.117**

Multinomial Logit Results

What CRP land included?	Exit 1992-7	Early signup wave	Exit 1992-7	Early signup wave
What non-CRP (previously farmed) land included?	All land	All land	Not farmed 1992	Not farmed 1992
Cultivated cropland	-0.301**	-0.826**	0.261**	-0.234**
Non-cultivated cropland	0.060**	-0.023**	-0.146**	-0.243**
Pasture	0.152**	0.001	-0.086**	-0.255**
CRP	-0.006**	0.846**	-0.003**	0.847**
Other	0.096**	0.003**	-0.025**	-0.115**
Subpop size	2731206	2887997	242928	399719
F	158386.88	3335.69	9520.32	330.46

Conservation Practice Results: Trimmed Populations

What CRP land included?	Not in CRP 1997	Exit 1992-7	Exit 1992-7
What non-CRP (previously farmed) land included?	All	All	Not farmed 1992
OLS	-0.008	-0.008	0.049**
Logit	-0.007	-0.006	0.039**
Probit	-0.007	-0.006	0.039**
Matching	-0.037*	-0.032+	0.021*

Conservation Practice Results: Non-Highly Erodible Land in Trimmed Populations

What CRP land included?	Not in CRP 1997	Exit 1992-7	Exit 1992-7
What non-CRP (previously farmed) land included?	All	All	Not farmed 1992
OLS	0.016	0.018	0.046*
Logit	0.023	0.026	0.043*
Probit	0.023	0.026	0.043+
Matching	0.011	0.003	0.076**

Conclusion

- Ex-CRP land is more likely than some land, and less likely than other land, to be farmed later
- Farmed ex-CRP land is more likely to adopt conservation practices than some non-CRP land
- Future extensions:
 - Effects of county-level demographic means
 - Welfare “analysis”?

1997 Land Use by “Trimmed” Categories

	CRP exit 1992-1997	CRP early signup wave	Non-CRP all prev. farmed	Non-CRP prev. farmed but not farmed 1992
Cultivated cropland	16,585 (52.74%)	12,846 (6.83%)	2,405,963 (88.79%)	58,070 (26.17%)
Non-cultivated cropland	3,687 (11.72%)	3,071 (1.63%)	122,729 (4.53%)	54,336 (24.49%)
Pastureland	6,571 (20.90%)	5,765 (3.06%)	92,916 (3.43%)	62,594 (28.21%)
Rangeland	2,625 (8.35%)	2,446 (1.30%)	15,846 (0.58%)	9,326 (4.20%)
Forest land	1,597 (5.08%)	1,338 (0.71%)	28,672 (1.06%)	20,408 (9.20%)
Other rural	375 (1.19%)	330 (0.18%)	15,586 (0.58%)	8,663 (3.90%)
CRP		162,418 (86.29%)	18,414 (0.68%)	1,278 (0.58%)
Total	31,440	188,214	2,700,126	214,675

1992 Land Use of Non-CRP Land in “Trimmed” Categories

	Non-CRP all prev. farmed	Non-CRP prev. farmed but not farmed 1992
Cultivated cropland	2,485,451 (92.05%)	
Non-cultivated cropland	101,463 (3.76%)	101,463 (47.26%)
Pastureland	77,565 (2.87%)	77,565 (36.13%)
Rangeland	8,809 (0.33%)	8,809 (4.10%)
Forest land	17,397 (0.64%)	17,397 (8.10%)
Other rural	9,433 (0.35%)	9,433 (4.39%)
Urban and built-up	1 (0.00%)	1 (0.00%)
Federal land	7 (0.00%)	7 (0.00%)
Total	2,700,126	214,675

1992-1997 Land Use Transitions (entire NRI sample)

	1997: Cult Crop	1997: Noncult Crop	1997: Pasture	1997: CRP	1997: other	Total
1992: Cultivated cropland	3,074,774 (91.86%)	128,892 (3.85%)	60,991 (2.82%)	19,423 (0.58%)	63,209 (1.89%)	3,347,289
1992: Non-cultivated cropland	99,630 (44.83%)	103,976 (46.79%)	11,100 (4.99%)	1,203 (0.54%)	6,324 (2.85%)	222,233
1992: Pastureland	45,856 (28.16%)	8,319 (5.11%)	98,426 (60.45%)	966 (0.59%)	9,260 (5.69%)	162,827
1992: CRP	18,038 (5.30%)	4,470 (1.31%)	7,966 (2.34%)	304,649 (89.49%)	5,298 (1.56%)	340,421
1992: other	25,806 (20.32%)	465 (0.37%)	1,043 (0.82%)	719 (0.57%)	98,978 (77.93%)	127,011
Total	3,264,115	246,122	179,526	326,960	183,069	4,199,781