

Keeping Land in Grass: Re-Enrollment Motivations with the Environmental Quality Incentive Program after the Conservation Reserve Program

Grünland erhalten: Motivationen für die Wiederaufnahme in das Environmental Quality Incentive Program nach dem Conservation Reserve Program

Aaron J. Harp*, Kristie Maczko

Department of Ecosystem Science and Management, University of Wyoming, Laramie, WY 82071

* Corresponding Author: Aharp1@UWyo.edu

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Summary

We present data from producers in the upper Great Plains of the US for whom at least one Conservation Reserve Program (CRP) contract expired in the last seven years. The survey covered two groups, one with a retired CRP contract and a second with a retired CRP contract who then enrolled in the Environmental Quality Incentives Program (EQIP) program. Most respondents at least tried to re-enroll into CRP, many unsuccessfully. The CRP group primarily moved to crops on the former CRP land, while EQIP respondents focused on cattle and grazing. Awareness of the EQIP program on the part of the CRP group was only 58%. We compared groups regarding what they considered doing with the land at the end of their respective programs, CRP and EQIP. We examined group differences in motivations and attitudes and found evidence of convergence. We also evaluated these differences using effect size statistics to determine their importance to our overall questions. Our overall conclusion is that the groups have a long history of program participation and there is little difference between them in both their motivation to participate and willingness to do so in the future.

Keywords: Conservation Reserve Program (CRP), Environmental Quality Incentives Program (EQIP), grassland, producer attitudes, producer motivations

Zusammenfassung

Wir präsentieren Daten von Erzeugern in den oberen Great Plains der USA, bei denen in den letzten sieben Jahren mindestens ein CRP-Vertrag (Conservation Reserve Program) ausgelaufen ist. Die Erhebung umfasste zwei Gruppen: eine mit einem ausgelaufenen CRP-Vertrag und eine zweite mit einem ausgelaufenen CRP-Vertrag, die sich dann für das Environmental Quality Incentives Program (EQIP) angemeldet hat. Die meisten Befragten versuchten zumindest, sich erneut für CRP anzumelden, viele jedoch erfolglos. Die CRP-Gruppe baute auf den ehemaligen CRP-Flächen hauptsächlich Ackerbau an, während die EQIP-Teilnehmer sich auf Rinder und Weideflächen konzentrierten. Der Bekanntheitsgrad des EQIP-Programms lag in der CRP-Gruppe bei nur 58 %. Wir verglichen die Gruppen hinsichtlich der Frage, was sie nach dem Ende ihrer jeweiligen Programme - CRP und EQIP - mit dem Land zu tun gedenken. Wir untersuchten die Gruppenunterschiede bei den Motivationen und Einstellungen und fanden Hinweise auf Konvergenz. Wir haben diese Unterschiede auch mit Hilfe von Effektgrößenstatistiken ausgewertet, um ihre Bedeutung für unsere Gesamtfragen zu bestimmen. Insgesamt kommen wir zu dem Schluss, dass die Gruppen seit langem an den Programmen teilnehmen und sich sowohl in ihrer Motivation zur Teilnahme als auch in ihrer Bereitschaft, dies in Zukunft zu tun, kaum unterscheiden.

Schlagwörter: Conservation Reserve Program (CRP), Environmental Quality Incentives Program (EQIP), Grünland, Einstellungen der Erzeuger, Motivationen der Erzeuger

1. Introduction

Conservation programs from the United States Department of Agriculture (USDA) have been ongoing for decades - the Farm Services Agency's (FSA) Conservation Reserve Program (CRP) celebrated its 35-year anniversary in 2020 (FSA, USDA, a) and the Natural Resource Conservation Service's (NRCS) Environmental Quality Incentives Program (EQIP) has been in place since 1996 (NRCS, USDA, a). Many farmers and millions of acres of have been enrolled in these programs since their inception. The CRP program retires land to achieve conservation goals such as soil health, water quality and wildlife habitat. The EQIP program is a working lands program, assisting producers to apply conservation practices while continuing to use the land for production. For an excellent description of such programs, please see Maher et al. (2003).

Social science research concerning the adoption of federal conservation programs is extensive. Ranjan et al. (2019) found 171 studies conducted from 1982 and 2017 examining the adoption of conservation practices and programs. These studies produced numerous predictors of producer attitudes and behavior toward conservation programs, with "few consistent determinants of conservation adoption" (Ranjan et al., 2019). Factors found to influence adoption of conservation practices include farm-level social characteristics, farm-level biophysical characteristics, farm-level management and financial characteristics, and plus exogenous factors (Prokopy et al., 2019). The list of individual, social and ecological factors is long, and consistent support for any one factor, or group of factors, remains elusive.

Liu et al. (2021) argued that the long-term ecological benefits of EQIP, as well as CRP, can be attributed to those programs only if producers would have implemented practices without payment, thus making them "additional" conservation practices. This notion is important because the persistence of environmental benefits after CRP should be a valuable policy outcome. Barnes et al. (2019) investigated re-enrollment and persistence of participation in conservation programs. They found that producers with expiring CRP contracts were interested in continuing in the program, though they had mixed success in doing so. In addition, they found that management plans in a post-CRP situation were generally amenable to retaining the conservation gains from CRP.

Pathak et al. (2021) found that participants in programs like EQIP displayed a higher "intensity of adoption" of

conservation practices. They found that participating in cost-share programs often led to an increase in the number of conservation practices, whether part of the cost-share contract or not. The salient question is whether these behaviors will persist through time. Skaggs et al. (1994) concluded that younger producers concerned about soil erosion were far more likely to either re-enroll into CRP or simply continue conservation practices. Dayer et al. (2018) put it this way: "...what remains largely unknown is what happens when payments stop: persistence or reversion? And why?"

This research seeks to evaluate attitudes and plans for producers in four Upper Midwest US states as they decided what to do with their acres after they did not re-enroll in CRP. We sampled one group of potential respondents who did not re-enroll in CRP and made other decisions regarding their land. A second group of potential respondents subsequently placed those former CRP acres under EQIP. Our primary question is whether the two groups leaving CRP, those who enrolled in EQIP and those who did not, have different attitudes or see different options for the former CRP land.

The literature cited above led us to reject an evaluation of factors leading to the adoption of conservation programs. Farmers with at least one expired CRP contract have already made an adoption decision regarding that program on that land. Instead, we are examining the attitudinal differences between two groups who have already adopted conservation programs and need to make decisions for their future conservation plans.

Our goal is to try to assess whether these acres will be placed on to a trajectory likely to retain grassland conservation gains over time. We are interested in two questions. First, what are the options and motivations of producers who cannot re-enroll in the CRP conservation program? Second, what are the options and motivations of producers that enroll their former CRP land into a second conservation program, EQIP?

2. Materials and Methods¹

We built a sample frame from a list of producers who had at least one CRP contract expire between 2015 and 2020 in the states of Colorado, Montana, North Dakota or South Dakota. We received samples from two sources, the FSA and NRCS. First, from the FSA, we obtained a list of landowners that had at least one expired CRP contract from 2015 to 2020 in the target states. That group was split into two populations. The

first were producers who returned former CRP land to some form of production. This list contained 6,514 names and addresses from which we drew a random sample of 2,200. The second were producers who enrolled former CRP land in the NRCS's EQIP program and are implementing EQIP contracts focused on keeping their former CRP land in grasslands. This list contained contact information for 668 producers. We surveyed the entire group.

The EQIP practices in the sample were focused on the grazing and rangeland conservation project practices are listed in Table 1. NRCS provided us with a complete list of EQIP participants using at least one of the practices in Table 1.

Both groups were surveyed by mail, with a web-based option. Overall response rates were low. The EQIP group response rate was 16.9% and the CRP group response rate was 13.7%. The low response rates and corresponding smaller sample sizes discouraged us from performing many types of analysis. For example, evaluating responses by state proves difficult due to low sample sizes for some states producing unreliable test statistics. Total returns by state are presented in Table 2.

Table 1. One or More EQIP Practices in Use by Potential Respondents in EQIP Sample.

Tabelle 1. Eine oder mehrere EQIP-Praktiken, die von potenziellen Befragten in der EQIP-Stichprobe angewendet werden.

Practice	% of Potential Respondents
Vegetative Cover, Grass Already Established	36.1%
Permanent Wildlife Habitat, Non-easement	18.3%
Establish Permanent Native Grasses	14.8%
Wetland Restoration	10.3%
Establish Permanent Introduced Grass & Legume	5.7%
Safe Grass	2.7%
Duck Nesting Habitat	2.6%
Rare And Declining Habitat	1.7%
Farmable Wetlands Buffer	1.6%
Establish Permanent Vegetative Reduce Salinity, Non-easement	1.2%
Shelterbelt Establish, Non-easement	1.1%
Farmable Wetlands Program Wetland	0.9%
Wildlife Food Plot	0.7%
Establish Permanent Salt Tolerant Vegetative Cover, Non-easement	0.6%
Field Windbreak Non-easement	0.5%
Wetland Restoration Non-floodplain	0.5%
Multiple Wildlife Habitat Buffers	0.4%
Filter Strips	0.1%

Table 2. CRP and EQIP final sample sizes by state.

Tabelle 2. CRP und EQIP endgültige Stichprobengrößen nach Bundesländern.

State	CRP	EQIP	Total
ND	139	35	174
SD	95	19	114
CO	27	18	45
MT	15	13	28
Other		25	25
Total	276	110	386

The state numbers presented in Table 2 show 25 respondents listed as "Other". A significant number of possible respondents in both groups had only business names in the database. Numerous types were represented including Limited Liability Corporations/Partnerships (LLC/LLP), corporations and various types of family trusts. Among our respondents, this represented almost 15% of the total returned surveys. Numerous potential respondents contacted us to say that they were legally operating the farm for the business entity in question but did not have enough information to answer the survey. Much of the acreage on such farms is leased to other operations.

An expected criticism of low response rates is that the data will suffer from non-response bias. Most research on the issue finds that nonresponse bias is more likely to affect univariate relationships and that it is reduced dramatically in multivariate settings (Amaya and Presser, 2017; Coon et al., 2020; Groves, 2006; Hellevik, 2016; Hendra and Hill, 2019). Still, to be prudent in this situation, we have chosen to limit our analysis and interpretation of results to the relationships we find in the sample we have. We cannot generalize any of these results to larger populations.

Finally, we take an alternative approach to analyzing response differences between the CRP and CRP/EQIP groups. Almost all research studies in this area report statistically significant differences between producers who adopt conservation practices and those who do not by applying p values to parameter estimates. While important, they do not offer much insight into how important a result might be relative to the stated hypotheses. "Effect size indicators are descriptive statistics that estimate the magnitudes of relationships or effects; they are meant to encourage substantive, rather than statistical, interpretations of significance (Brooks et al., 2013). Effect size is useful in this study because attitudinal differences between the two groups are hypothesized to be small since they both have experience with conservation programs. We have chosen a nonparametric approach

to examining group differences and will report three effect sizes to evaluate those differences.

Both samples were presented with three sets of attitudinal items that allow us to compare responses across groups. Our questions are Likert-type scales of various lengths. Each scale is scored as Strongly Agree = 1, Agree = 2, Neither = 3, Disagree = 4, Strongly Disagree = 5. In discussing our analysis, the term “lower” is associated with agreement, while “higher” is associated with disagreement with the statement in the survey item.

The approach most often used to compare responses between two groups in this situation is the two-sample t-test. This ubiquitous test assumes sample independence, equal variance and normal distributions for the populations (Kloke and McKean, 2015). Attitudinal items such as those presented here are often in ordinal, Likert-type scales. At first glance, this type of categorical data appears to violate one or more of the assumptions of a two-sample t-test. The central limit theorem is sometimes invoked to ignore these violations, simply treat the ordinal data as if it were continuous and apply the t-test (de Winter and Dodou, 2012). Ordinal data often violates the normal distribution assumption about the population means. After examining box plots, histograms and tests to the data, we concluded that these data are non-normally distributed.

Non-parametric tests for two-sample situations can be used to evaluate Likert-scales for two independent samples and we agree with Cliff (1993) that ordinal questions deserve ordinal answers. We used the two-sample Wilcoxon rank-sum test. The Wilcoxon procedure tests that hypothesis that two groups are from the same population, with the alternative being that one group is “stochastically larger” than the other (Kloke and McKean, 2015). We performed Wilcoxon tests using the “wilcox_test” function in the “rstatix” package of the R software (Kassambara, 2022; R Core Team, 2022). We set up the data to determine if the CRP group has higher scores on our items than does the EQIP group.

In addition, we are reporting effect sizes along with the non-parametric statistics. Reporting effect sizes is a standard practice in psychology and medicine because they offer readers an easily understood way to distinguish between statistical and practical significance (Kirk, 1996). They allow us to estimate not just the statistically significant differences, but to estimate how large, and important, the difference might be. Effect sizes for nonparametric data are not as numerous as for normally distributed data, but we are reporting two. One effect size estimate used commonly for nonparametric situations is Cohen’s r . Estimates of r are used in two-sample

situations because the measure is independent of sample size (Fritz et al., 2012). Cohen advises that r effects be interpreted as follows: 0.10 – 0.30 are small, 0.30 – 0.50 are medium and $> .50$ are large (Cohen, 1988).

Second, we estimate the effect size Cliff’s Delta, δ . This effect size measure determines the degree of overlap between two ordinal distributions (Wan et al., 2020). It ranges from -1 to 1, with 0 indicating complete overlap between the distributions. The sign of δ indicates which groups is dominant: when the data from the second group (EQIP) has a higher score (more likely to disagree) than the first group (CRP), then Cliff’s δ is negative. A suggested interpretation for the absolute value of δ are $|\delta| < 0.147$ – Negligible, $0.147 \leq |\delta| < 0.330$ – Small, $0.330 \leq |\delta| < 0.474$ – Medium and $|\delta| \geq 0.474$ – Large (Wan et al., 2020).

The third effect size statistic we report is a nonparametric extension of what is commonly referred to as the “common language effect” (CL) statistic (Vargha and Delaney 2000; McGraw and Wong 1992). CL estimates “the probability that a randomly chosen member of Group 1 scores higher than a randomly chosen member of Group 2 (Ruscio, 2008).” Delaney and Vargha (2002) estimated a CL effect for non-parametric data, labeled A . Simulation studies showed that estimates of A “yielded unbiased estimates of parameters and stable standard errors across normal and nonnormal population distributions as well as homogenous and heterogeneous population variances” (Ruscio, 2008). A is sometimes referred to as a measure of “stochastic superiority” (Delaney and Vargha, 2002). Values for A range from 0 to 1, with a value of 0.5 indicating that there is no difference between the groups. The estimates of Delaney & Vargha’s A can be interpreted as the probability that the CRP group will score higher (more likely to disagree) than the EQIP group on an item. A suggested interpretation for values of $A < 0.56$ are small, from 0.56 – 0.71 are medium, and ≥ 0.71 should be considered large (Vargha and Delaney, 2000).

3. Results

3.1 Results by Group

An important question for both groups is whether they desired to return the land back to CRP. The majority of the CRP group considered going back into CRP (Yes = 83.0%), while those who put their former CRP into EQIP did not strongly consider returning it to CRP (No = 75.5%). FSA numbers concerning re-enrollment of land back into CRP

show roughly 40% of expiring contracts from 2018 to 2022 had been enrolled more than once (FSA, 2022). The CRP group may have wanted to return land to CRP and, having enrolled that land more than once, may have been denied. A substantial proportion (50%) of our EQIP respondents also indicated that they had enrolled land previously in EQIP. Taken together, this information points to producers with a lot of experience in these two federal conservation programs, with land placed in both CRP and EQIP multiple times. The EQIP group could have easily planned to pivot out of CRP into EQIP, and not be interested in re-enrollment.

The purpose of this study is to evaluate producer decisions that keep former CRP lands managed as grasslands. The primary crops for each group indicate that the group enrolled in EQIP predominantly manages their former CRP land for cattle and livestock (67.3%), while the CRP comparison group predominantly manages for crops (60.1%). This reflects the sample frame used to choose the EQIP group. This raises a question as to whether the CRP group had sufficient information to evaluate EQIP as an option. We asked CRP respondents if they were aware of the EQIP program. Just over 39% reported that they were not aware of the program. This percentage implies that almost 40% of producers with expired CRP did not make a choice to enroll in EQIP but were simply unaware of the program.

Is the level of awareness of the EQIP program shared by other USDA programs? Table 3 shows responses from the CRP group about their participation in five such programs.

The EQIP program had the highest past participation percentage (17.8%). The Wetland Reserve Easements program had the highest current participation rate at 12.6%. EQIP (10.9%) and CREP (13.8%) were considered most often for future participation. The majority of producers never had participated in nor were they considering participation in any of the conservation programs listed.

3.2 Two Sample Comparisons: CRP and EQIP Respondents²

First, both groups were asked questions about what they might do when either their CRP or EQIP contract expired. These survey items are borrowed from Barnes et al. (2019). Descriptive statistics are presented in Table 4. Results for the independent samples Wilcoxon *W* and effect size estimates are presented in Table 5. Two of the five items show evidence of significant differences between groups as the p-values for both questions were <0.001. Regarding effect size, Cohen's *r* shows these items to have a small effect, with their absolute values being around 0.20. However, the sign for the item "Leave the majority of this field in grass" has a Cohen's *r* of -0.22, indicating that the CRP group distribution is very different from the EQIP group distribution. This makes sense since the EQIP practices being implemented all concern grazing. The group difference for a third item is close to significance, with p-value > 0.0762, but its Cohen's *r* value is negligible.

Table 3. CRP Respondents: "Do you currently or have you ever participated in any of the following United States Department of Agriculture (USDA) - sponsored conservation incentive programs? (Mark all that apply.)"

Tabelle 3. CRP-Befragte: "Nehmen Sie derzeit oder haben Sie in der Vergangenheit an einem der folgenden vom US-Landwirtschaftsministerium (USDA) geförderten Programm zur Förderung des Naturschutzes teilgenommen? (Markieren Sie alle zutreffenden Punkte.)"

Program		Yes, in the past	Yes, currently	Possibly in the future	No	Missing	Total
Agricultural Conservation Easement Program (ACEP)	Frequency	8	9	22	199	38	276
	Percent	2.9%	3.3%	8.0%	72.1%	13.8%	100.0%
Agricultural Land Easements (ALE)	Frequency	6	7	17	208	38	276
	Percent	2.2%	2.5%	6.2%	75.4%	13.8%	100.0%
Conservation Reserve Enhancement Program (CREP)	Frequency	14	15	38	172	37	276
	Percent	5.1%	5.4%	13.8%	62.3%	13.4%	100.0%
Environmental Quality Incentives Program (EQIP)	Frequency	49	18	30	141	38	276
	Percent	17.8%	6.5%	10.9%	51.1%	13.8%	100.0%
Wetland Reserve Easements (WRE)*	Frequency	12	35	27	167	36	277
	Percent	4.3%	12.6%	9.7%	60.3%	13.0%	100.0%

*Respondent answered twice.

*Der Befragte hat zweimal geantwortet.

Table 4. Descriptive Statistics for both CRP and EQIP respondents: “Following the end of your CRP/EQIP contract, how likely would you be to take any of the following actions?”*

Tabelle 4. Deskriptive Statistiken für CRP- und EQIP-Teilnehmer “Wie wahrscheinlich ist es, dass Sie nach dem Ende Ihres CRP/EQIP-Vertrags eine der folgenden Maßnahmen ergreifen werden?”*

Item	CRP			EQIP			Total		
	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Convert the majority of this field to dryland crops	2.76	1.47	229	2.09	1.29	102	2.55	1.45	331
Convert the majority of this field to irrigated crops	1.28	0.74	215	1.26	0.74	102	1.28	0.74	317
Leave the majority of this field in grass	3.18	1.57	222	3.98	1.32	103	3.43	1.54	325
Sell the majority of this field	1.54	1.07	219	1.31	0.78	97	1.47	0.99	316
Enroll the majority of this field in another conservation program	3.37	1.48	242	3.50	1.13	102	3.41	1.39	344

* Very Unlikely = 1, Unlikely = 2, Neither = 3, Likely = 4, Very likely = 5

* Sehr unwahrscheinlich = 1, Unwahrscheinlich = 2, Weder = 3, Wahrscheinlich = 4, Sehr wahrscheinlich = 5

The estimates for Cliff's δ show a similar pattern – statistically significant differences that are not important. Again, the sign of the item on leaving the field in grass shows a measure of the differences in item responses – when the data from the second group (EQIP) has a higher score (more likely) than the first group (CRP) then Cliff's δ is negative. The estimates of Delaney & Vargha's A can be interpreted as the probability that the CRP group will score higher than the EQIP group on an item. The CRP group is more likely than the EQIP group to put their fields back into crops ($A = 0.62$) and much less likely to keep their fields in grass ($A = 0.36$).

Second, both groups were asked for their attitudes concerning stewardship and decision-making. These are borrowed from Sweikert and Gigliotti (2019a; 2019b). Descriptive statistics are presented in Table 6. Results for the independent samples Wilcoxon W and effect size estimates are presented in Table 7. Several items show evidence of significant differences between groups with p -values < 0.05 . The values of Cohen's r show that these differences produced small effects. The difference between groups was significant but not large. Again, estimates for Cliff's δ are below 0.02 for most items except for the questions regarding the role livestock prices

Table 5. Independent Samples Wilcoxon W , Cohen's r , Cliff's δ , Delaney & Vargha's A . “Following the end of your CRP/EQIP contract, how likely would you be to take any of the following actions?” *

Tabelle 5. Unabhängige Stichproben Wilcoxon W , Cohen's r , Cliff's δ , Delaney & Vargha's A . “Wie wahrscheinlich ist es, dass Sie nach dem Ende Ihres CRP/EQIP-Vertrags eine der folgenden Maßnahmen ergreifen werden?”*

Item	Cohen's r								Cliff's δ				Delaney & Vargha's A			
	Wilcoxon W				95% CI				95% CI				95% CI			
	n1	n2	W	p-value	r	Low	High	Effect Size	d	Low	High	Effect Size	A	Low	High	Effect Size
Convert the majority of this field to dryland crops	229	102	14,590	<0.001	0.19	0.09	0.28	small	0.25	0.12	0.37	small	0.62	0.56	0.68	medium
Convert the majority of this field to irrigated crops	215	102	11,286	0.5209	0.03	-0.08	0.13	small	0.03	-0.06	0.12	negligible	0.51	0.47	0.56	small
Leave the majority of this field in grass	222	103	8,150	<0.001	-0.22	-0.31	-0.12	small	-0.29	-0.40	-0.16	small	0.36	0.30	0.42	small
Sell the majority of this field	219	97	11,606	0.0762	0.09	0.00	0.18	small	0.09	0.00	0.19	negligible	0.55	0.33	0.43	small
Enroll the majority of this field in another conservation program	242	102	12,288	0.9478	0.00	-0.09	0.08	small	0.00	-0.12	0.11	negligible	0.50	0.44	0.56	small

* Very Unlikely = 1, Unlikely = 2, Neither = 3, Likely = 4, Very likely = 5

* Sehr unwahrscheinlich = 1, Unwahrscheinlich = 2, Weder = 3, Wahrscheinlich = 4, Sehr wahrscheinlich = 5

Table 6. Descriptive Statistics for both CRP and EQIP respondents. “Please indicate if you agree or disagree with the following statements...” *
Tabelle 6. Deskriptive Statistiken für CRP- und EQIP-Teilnehmer: “Bitte geben Sie an, ob Sie den folgenden Aussagen zustimmen oder nicht zustimmen...”**

Item	CRP			EQIP			Total		
	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
I consider myself a steward of my property and feel a strong personal obligation to preserve its environmental qualities.	1.36	0.62	268	1.18	0.41	109	1.31	0.58	377
Working to maintain the environmental qualities of my property, such as improving soil health and native vegetation, is not always worth the time and effort.	3.38	1.30	266	3.29	1.39	109	3.35	1.33	375
To me, maintaining the environmental qualities of my property is largely a matter of money; I wouldn't do it unless there was a financial reward.	3.40	1.12	263	3.34	1.10	108	3.39	1.11	371
I prefer ranching to farming.	3.19	1.22	263	2.58	1.14	107	3.01	1.23	370
I would manage my property in exactly the same way with or without government incentives such as NRCS programs.	2.88	1.15	265	2.83	1.17	109	2.86	1.16	374
I would feel guilty if I didn't succeed in conserving environmental qualities of my property.	2.19	0.94	263	1.94	0.86	109	2.11	0.92	372
Crop prices affect my management decisions for my property.	2.50	1.10	266	2.62	1.11	107	2.54	1.10	373
Livestock prices affect my management decisions for my property.	3.16	1.20	249	2.56	1.15	108	2.98	1.22	357
It is unusual in my community to participate in programs like EQIP, CRP or CSP.	3.56	1.01	267	3.79	0.88	107	3.63	0.98	374
The people around me I hold close (neighbors, family, friends, etc.) encouraged me to participate in programs such as EQIP.	3.33	0.95	267	3.06	1.01	108	3.25	0.98	375
My family, and the practices we used when I was a child, strongly influence the practices I use today.	2.74	1.10	265	2.57	1.01	108	2.69	1.08	373

* Strongly Agree = 1, Agree = 2, Neither = 3, Disagree = 4, Strongly disagree = 5

* Stimme völlig zu = 1, Stimme zu = 2, Keines von beiden = 3, Stimme nicht zu = 4, Stimme überhaupt nicht zu = 5

play in decision making and preferring ranching to farming. The value $\delta = 0.64$ indicates that the CRP group's disagreement with the “livestock prices” statement was far greater than the EQIP group. The value $\delta = 0.29$ indicates that the CRP group disagreed with the “prefer ranching” statement, but not as strongly. The values of A were mostly neutral, except for “I prefer ranching to farming” ($A = 0.64$) and “Livestock prices affect my management decisions for my property” ($A = 0.57$). Again, the CRP group disagreed with these statements far more than did the EQIP group.

Finally, respondents were asked if they agreed with a set of statements regarding agricultural practices and their role in agriculture. These items also follow Sweikert and Gigliotti (2019a; 2019b). Descriptive statistics are presented in Table 8. Results for the independent samples Wilcoxon W and effect size estimates are presented in Table 9 and indicate that five of the fourteen items show statistically significant differences between the CRP and EQIP group responses. Our estimates of Cohen's r again show no large effects. One of the estimates of A stands out. The statement “If you take care of the land, it will take care of you” produced $A = .60$, indicating that the probability that a respondent from

the CRP group will choose a higher number (toward neutrality) on the Likert scale for this item is 0.60. The value of A tells us that while both groups may agree with the statement, the CRP group are not as firm in that agreement - there is a 0.60 probability that they will score higher (toward neutrality) on the scale.

4. Discussion

We presented data from a survey of producers in the upper Great Plains who had at least one CRP contract expire in the last seven years. The survey covered two groups, one with a retired CRP contract and a second with a retired CRP contract who then transitioned that land into the EQIP program. Re-enrollment results were compelling: the majority of the CRP group considered re-enrolling while the majority of the EQIP group did not. We found that 50% of our EQIP group had previously enrolled in EQIP. The CRP group primarily moved to crops on the former CRP land, while EQIP respondents focused on cattle and grazing. Awareness of the EQIP program on the part of the CRP group was 58%.

Table 7. Independent Samples Wilcoxon W, Cohen's r, Cliff's δ , Delaney & Vargha's A. "Please indicate if you agree or disagree with the following statements..."*Tabelle 7. Unabhängige Stichproben Wilcoxon W, Cohen's r, Cliff's δ , Delaney & Vargha's A. "Bitte geben Sie an, ob Sie den folgenden Aussagen zustimmen oder nicht zustimmen..."*

Item	Cohen's r								Cliff's δ				Delaney & Vargha's A			
	Wilcoxon W				95% CI				95% CI				95% CI			
	n1	n2	W	p-value	r	Low	High	Effect Size	d	Low	High	Effect Size	A	Low	High	Effect Size
I consider myself a steward of my property and feel a strong personal obligation to preserve its environmental qualities.	268	109	16,629	0.0064	0.14	0.04	0.23	small	0.14	0.05	0.23	negligible	0.57	0.52	0.61	medium
Working to maintain the environmental qualities of my property, such as improving soil health and native vegetation, is not always worth the time and effort.	266	109	14,844	0.6766	0.02	-0.08	0.12	small	0.03	-0.10	0.15	negligible	0.51	0.45	0.58	small
To me, maintaining the environmental qualities of my property is largely a matter of money; I wouldn't do it unless there was a financial reward.	263	108	14,502	0.7405	0.02	-0.09	0.11	small	0.02	-0.10	0.14	negligible	0.51	0.45	0.57	small
I prefer ranching to farming.	263	107	18,148	0.0000	0.23	0.14	0.32	small	0.29	0.17	0.40	small	0.64	0.59	0.71	medium
I would manage my property in exactly the same way with or without government incentives such as NRCS programs.	265	109	14,682	0.7953	0.01	-0.09	0.11	small	0.02	-0.11	0.14	negligible	0.51	0.45	0.57	small
I would feel guilty if I didn't succeed in conserving environmental qualities of my property.	263	109	16,531	0.0130	0.13	0.03	0.22	small	0.15	0.03	0.27	small	0.58	0.52	0.64	medium
Crop prices affect my management decisions for my property.	266	107	13,332	0.3183	-0.05	-0.15	0.06	small	-0.06	-0.19	0.06	negligible	0.47	0.41	0.53	small
Livestock prices affect my management decisions for my property.	249	108	17,221	0.0000	0.22	0.12	0.31	small	0.64	0.16	0.40	large	0.57	0.58	0.70	medium
It is unusual in my community to participate in programs like EQIP, CRP or CSP.	267	107	12,488	0.0445	-0.10	-0.20	-0.01	small	-0.13	-0.24	-0.01	negligible	0.44	0.38	0.49	small
The people around me I hold close (neighbors, family, friends, etc.) encouraged me to participate in programs such as EQIP.	267	108	16,602	0.0142	0.13	0.03	0.23	small	0.15	0.03	0.27	small	0.58	0.52	0.63	small
My family, and the practices we used when I was a child, strongly influence the practices I use today.	265	108	15,352	0.2507	0.06	-0.04	0.16	small	0.07	-0.05	0.19	negligible	0.54	0.47	0.60	small

* Strongly Agree = 1, Agree = 2, Neither = 3, Disagree = 4, Strongly disagree = 5

* Stimme völlig zu = 1, Stimme zu = 2, Keines von beiden = 3, Stimme nicht zu = 4, Stimme überhaupt nicht zu = 5

This mitigates against adoption of EQIP by these producers. Almost 18% of the CRP group had participated in EQIP in the past and over 6% currently are so this level of awareness indicates that if NRCS wanted to recruit more participants for EQIP, there appears to be room for success.

We compared groups regarding what they considered doing with the land at the end of their respective programs, CRP and EQIP. The CRP group reported being more likely to

convert land back to crops, the EQIP group reported being more likely to keep their land in grass, and both supported the idea of placing it back into another conservation program. The respondents were already participants in federal conservation programs. Regardless of their motivations, they had already adopted a conservation-based program in return for payment. It seems reasonable that they would be more similar than different.

Table 8. Descriptive Statistics for both CRP and EQIP respondents: “Please indicate if you agree or disagree with the following statements regarding agricultural practices and your role in agriculture.”

Tabelle 8. Deskriptive Statistik für CRP- und EQIP-Befragte. “Bitte geben Sie an, ob Sie den folgenden Aussagen über landwirtschaftliche Praktiken und Ihre Rolle in der Landwirtschaft zustimmen oder nicht zustimmen.”

Item	CRP			EQIP			Total		
	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N
Farmers and ranchers have an obligation to protect the soil, water, plants, habitat, and fish and wildlife on their land.	1.56	0.66	269	1.52	0.81	107	1.55	0.70	376
If you take care of the land, it will take care of you.	1.59	0.60	269	1.36	0.52	107	1.52	0.59	376
All parts of the ecosystem, down to the microorganisms in the soil, are important for proper ecosystem functioning.	1.64	0.66	266	1.44	0.60	107	1.58	0.65	373
Restored lands maximize both productivity and ecosystem function.	1.80	0.68	265	1.64	0.73	106	1.75	0.70	371
Farmers and ranchers are only temporary trustees of the land, and it is their responsibility to take good care of it for future generations.	1.62	0.71	265	1.40	0.63	108	1.56	0.69	373
The diversity of native plants and wildlife in an area is a sign of the quality of the natural environment.	1.82	0.84	266	1.70	0.79	108	1.79	0.82	374
The quality of the land is positively influenced by the diversity of native plants and animals that live on and around it.	1.94	0.92	268	1.79	0.81	107	1.90	0.89	375
Farmers and ranchers are masters of the land.	2.15	1.03	267	2.12	1.07	107	2.14	1.04	374
The needs of farmers and ranchers should take priority over the conservation of land.	2.99	0.99	268	3.00	1.12	106	2.99	1.03	374
Farmers and ranchers have the right to use the soil, water, plants, and animals on their land in any way they see fit.	2.94	1.15	270	2.77	1.33	106	2.90	1.20	376
The best use of land should be determined by the amount of profit that can be earned annually.	3.36	1.05	267	3.50	0.99	107	3.40	1.04	374
Farmers and ranchers should focus on maximizing production on their land regardless of environmental costs.	3.82	0.91	269	3.95	0.93	107	3.86	0.91	376
Because farmers' and ranchers' livelihoods depend on the land, they are the best stewards of the land.	2.44	1.10	266	2.10	1.10	107	2.34	1.11	373
Grazing land is easier to maintain than farmland.	2.71	0.96	268	2.80	1.09	108	2.73	1.00	376

* Strongly Agree = 1, Agree = 2, Neither = 3, Disagree = 4, Strongly disagree = 5

* Stimme völlig zu = 1, Stimme zu = 2, Keines von beiden = 3, Stimme nicht zu = 4, Stimme überhaupt nicht zu = 5

Attitude items about the farm and stewardship showed that the EQIP group was indeed composed of ranchers as questions concerning livestock prices and ranching produced answers significantly different from the CRP group. But again, the effect sizes for all questions were small. Finally, the attitude items concerning agricultural practices and the producer's role in agriculture saw a similar pattern. Statistically significant differences for some items were apparent, but with very small effects. In this case, our conclusions may vary, but all have a few underlying themes.

- Most of the CRP group would be re-enrolled if they could be. As reported above, over 80% of the CRP group considered going back to CRP. The fact that they did not may point to the program not accepting their applications even though they have experience with CRP.
- A significant number of the CRP group were not aware of the EQIP option.

- The EQIP group were ready to cease their participation in CRP and half of them had done so before, so the usual barriers to conservation program participation seem irrelevant.
- One group (EQIP) saw grass as their goal. The other (CRP) were more likely to favor crops.
- With the help of the program, the EQIP group reported adopting practices that keep the land in grass and make it productive for ranching and cattle.

But most interestingly, their attitudes about stewardship, the land and conservation ideas were very similar. Though years of research may have identified certain attitudes or motivations that sometimes underpin the adoption of conservation practices, in this case, this particular set of attitudes did not differentiate these two sample groups. Over time, both groups participated in USDA conservation programs, were still willing to

Table 9. Independent Samples Wilcoxon W, Cohen's r , Cliff's δ , Delaney & Vargha's A . "Please indicate if you agree or disagree with the following statements regarding agricultural practices and your role in agriculture."*

Tabelle 9. Unabhängige Stichproben Wilcoxon W, Cohen's r , Cliff's δ , Delaney & Vargha's A . "Bitte geben Sie an, ob Sie den folgenden Aussagen über landwirtschaftliche Praktiken und Ihrer Rolle in der Landwirtschaft zustimmen oder nicht zustimmen."*

	Cohen's r								Cliff's δ				Delaney & Vargha's A			
	Wilcoxon W				95% CI				95% CI				95% CI			
	n1	n2	W	p-value	r	Low	High	Effect Size	d	Low	High	Effect Size	A	Low	High	Effect Size
Farmers and ranchers have an obligation to protect the soil, water, plants, habitat, and fish and wildlife on their land.	269	107	15,386	0.2367	0.06	-0.04	0.16	small	0.07	-0.04	0.18	negligible	0.53	0.48	0.59	small
If you take care of the land, it will take care of you.	269	107	17,345	0.0004	0.18	0.09	0.27	small	0.21	0.10	0.31	small	0.60	0.54	0.65	small
All parts of the ecosystem, down to the microorganisms in the soil, are important for proper ecosystem functioning.	266	107	16,605	0.0048	0.14	0.05	0.24	small	0.17	0.05	0.28	small	0.58	0.52	0.64	small
Restored lands maximize both productivity and ecosystem function.	265	106	15,950	0.0250	0.11	0.01	0.22	small	0.14	0.01	0.26	negligible	0.57	0.50	0.63	small
Farmers and ranchers are only temporary trustees of the land, and it is their responsibility to take good care of it for future generations.	265	108	16,864	0.0023	0.16	0.06	0.25	small	0.18	0.07	0.28	small	0.59	0.54	0.64	small
The diversity of native plants and wildlife in an area is a sign of the quality of the natural environment.	266	108	15,501	0.1945	0.07	-0.04	0.17	small	0.08	-0.04	0.19	negligible	0.54	0.48	0.60	small
The quality of the land is positively influenced by the diversity of native plants and animals that live on and around it.	268	107	15,395	0.2339	0.06	-0.04	0.16	small	0.07	-0.14	0.19	negligible	0.54	0.47	0.60	small
Farmers and ranchers are masters of the land	267	107	14,596	0.7297	0.02	-0.09	0.12	small	0.02	-0.10	0.15	negligible	0.51	0.45	0.58	small
The needs of farmers and ranchers should take priority over the conservation of land.	268	106	14,014	0.8330	-0.01	-0.11	0.10	small	-0.01	-0.14	0.12	negligible	0.49	0.43	0.55	small
Farmers and ranchers have the right to use the soil, water, plants, and animals on their land in any way they see fit.	270	106	15,489	0.2010	0.07	-0.04	0.17	small	0.08	-0.05	0.21	negligible	0.54	0.48	0.61	small
The best use of land should be determined by the amount of profit that can be earned annually.	267	107	13,202	0.2328	-0.06	-0.16	0.04	small	-0.08	-0.20	0.05	negligible	0.46	0.40	0.52	small
Farmers and ranchers should focus on maximizing production on their land regardless of environmental costs.	269	107	13,072	0.1391	-0.08	-0.18	0.03	small	-0.09	-0.21	0.03	negligible	0.45	0.39	0.52	small
Because farmers' and ranchers' livelihoods depend on the land, they are the best stewards of the land.	266	107	16,852	0.0037	0.15	0.04	0.25	small	0.18	0.06	0.30	small	0.59	0.53	0.65	small
Grazing land is easier to maintain than farmland.	268	108	13,788	0.4537	-0.04	-0.14	0.07	small	-0.05	-0.17	0.08	negligible	0.48	0.41	0.54	small

* Strongly Agree = 1, Agree = 2, Neither = 3, Disagree = 4, Strongly disagree = 5

* Stimme völlig zu = 1, Stimme zu = 2, Keines von beiden = 3, Stimme nicht zu = 4, Stimme überhaupt nicht zu = 5

do so and displayed a convergence of motivations and attitudes about their participation. This leads us to conclude that making additional programs such as EQIP or the USDA Conservation Stewardship Program (CSP) more widely known to farmers not re-enrolling in CRP might provide a foundation for the conservation persistence policy makers are seeking.

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Endnotes

¹To create this survey, we borrowed heavily from two sources. First, we replicate questions from Barnes et al. (2019) regarding plans for former CRP land. Second, we utilize attitudinal items from Sweikert and Gigliotti (2019a; 2019b).

²All analyses were conducted using R. (R Core Team, 2022). Two-sample Wilcoxon tests, also known as in R as 'Mann-Whitney' tests, were calculated using the R package "rstatix" (Kassambara, 2023). Effect size statistics were calculated using two R packages: "rcompanion" (Mangiafico, 2023) and "effsize" (Torchiano, 2016).

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