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Do Messages Matter in Conservation Practice Adoptions?

Evidence from a Farmer Information Treatment

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Background

- The Midwestern landscape is facing significant water quality problems attributable to nutrient pollution from annual row crop agriculture.
- Key edge-of-field practices have been remarkably underutilized even though they can effectively reduce nutrient delivery.
- **Saturated buffers** divert existing tile drainage outflow through the subsurface of a perennial vegetative riparian buffer before it enters the waterway.

Objectives

- To promote knowledge uptake on edge-of-field practices, facilitating farmers and landowners to adopt saturated buffers;
- To investigate whether and how information treatments influence farmers' take-up decisions on saturated buffers;
- To identify the most effective education strategy to accelerate future adoption.

Information Treatment Experiments

- Conducted an online survey to 4,360 samples of landowners and farmers from 5 different HUC 8 watersheds in Iowa.
- Received 726 surveys out of 4,228 eligible farmers, resulting in a response rate of 17.2%.
- Information treatment experiments: presented respondents with information highlighting the environmental benefits of saturated buffers.
- Three treatments: a two-page fact sheet, a video narrative talked by an extension professional, and a video narrative talked by an early adopter.



Croups	Trootmonte	Information Treatments Details			
Groups	Treatments	Information meatments Details			
Group 1	A fact sheet	We presented recipients with an online two-page fact sheet on for saturated buffers before contingent valuation questions.			
Group 2	A video by an ISU extension professional	We presented recipients with a 2-min educational video by an			
Group 3	A video by an early farmer adopter	We presented recipients with a 2-min educational video by an			
Group 4	Control group	We presented recipients only the survey questionnaire.			

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Econometric Model

Assume that farmer i is offered a contract j and derives utility U_{ij} and U_{i0} from accepting an edge-of-field contract j and rejecting the contract, respectively. The utility, U_{ij} , that farmer i derives from program j can be written as $U_{ij} = V_{ij} + \epsilon_{ij}$. The probability that a farmer will choose to participate in a hypothetical program is: $P_{ij} = e^{V_{ij}} / (1 + e^{V_{ij}}),$

The indirect utility of farmer i, if he were to accept contract j, is given by the following equation:

 $V_{ii} = \beta_1 Factsheet_i + \beta_2 Famer_i + \beta_3 Extension_i + \alpha X_i + \delta Z_{ii} + \mu_k$ where

- $\triangleright X_i$ is a vector of individual-specific characteristics, including scores measuring perceived environmental benefits and barriers, and a dummy variable whether any neighbor adopted saturated buffer;
- $\triangleright Z_{ij}$ denotes program attributes in the contract j received by farmer i, including the cost-share payment and a dummy for whether a bonus is offered in a contract;



 $\blacktriangleright \mu_k$ denotes a fixed spatial effect.

environmental benefits

ISU extension professional.

early farmer adopter.

Demographics	Group N		Group E		<i>p</i> -value
	Mean	Std.Dev.	Mean	Std.Dev.	
Age	65.94	12.77	64.78	12.43	0.29
Male	0.83	0.38	0.82	0.38	0.90
Income $>$ \$250,000 1	0.27	0.44	0.37	0.48	0.01
College ²	0.47	0.50	0.47	0.50	0.91
Farming years	34.26	15.82	34.77	15.54	0.74
EnvScore	13.00	3.21	13.50	3.26	0.06
BarrierScore	12.32	3.15	12.12	3.21	0.42

Table: Regression Results and Subgroup Analysis



- conservation experience (Group N).
- video, then the professional video.



Results

	Dependent variable					
	Whether accept a program?					
	Full Group	Group N	Group E			
	(1)	(2)	(3)			
	0.191	2.682**	-0.262			
	(0.282)	(1.068)	(0.339)			
	-0.075	2.538**	-0.540			
	(0.290)	(1.078)	(0.352)			
	-0.401	2.146**	-0.847**			
	(0.290)	(1.076)	(0.355)			
	1.113**	-0.262	1.672**			
	(0.565)	(1.022)	(0.708)			
	-0.470*	-0.545	-0.378			
	(0.283)	(0.543)	(0.349)			
	-0.088	0.134	-0.187			
	(0.222)	(0.416)	(0.277)			
	0.166***	0.123*	0.191***			
	(0.034)	(0.066)	(0.043)			
	-0.062^{*}	-0.078	-0.052			
	(0.032)	(0.064)	(0.039)			
effect	Yes	Yes	Yes			
	627	225	402			
bd	-372.493	-111.787	-240.829			

*p<0.1; **p<0.05; ***p<0.01

Conclusions

Information treatments are effective for farmers with little

► The fact sheet is the most effective treatment, followed by the farmer

Farmers with conservation experience (Group E) are more sensitive to cost-share payment. With higher payment, the adoption rate is higher.