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# Do Messages Matter in Conservation Practice Adoptions?

## Evidence from a Farmer Information Treatment

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# Do Messages Matter in Conservation Practice Adoptions? Evidence from a Farmer Information Treatment



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## Background

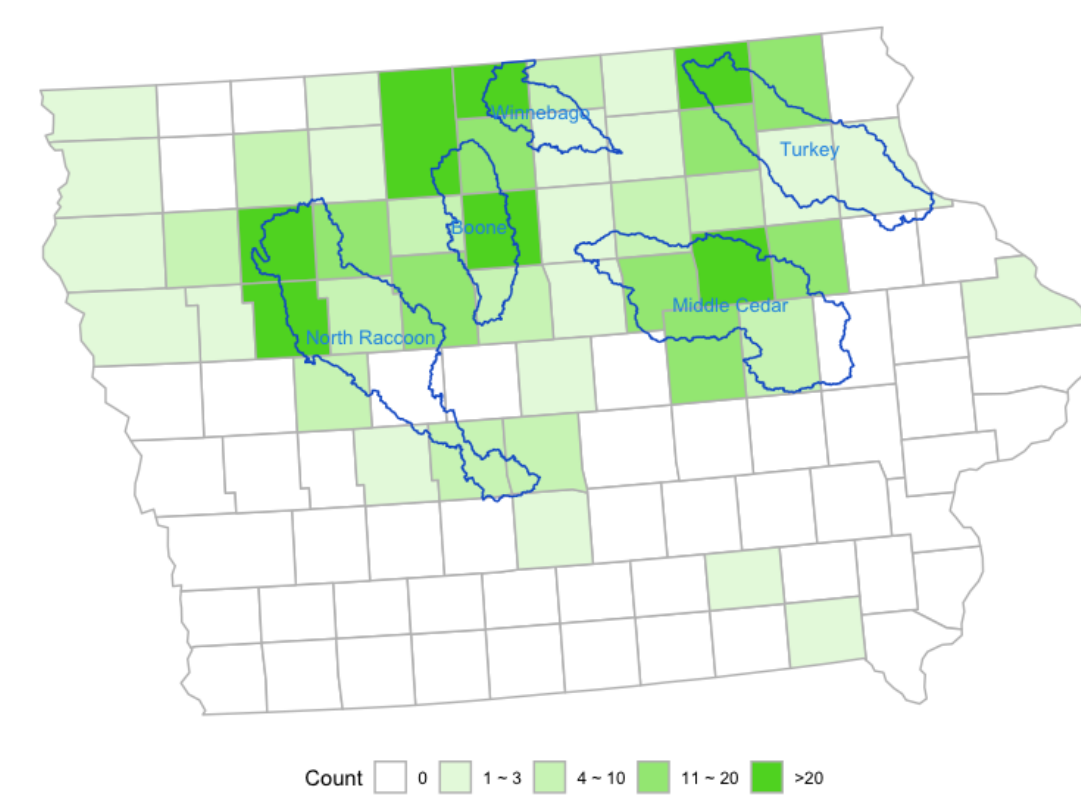
- ▶ The Midwestern landscape is facing significant water quality problems attributable to nutrient pollution from annual row crop agriculture.
- ▶ Key edge-of-field practices have been remarkably underutilized even though they can effectively reduce nutrient delivery.
- ▶ **Saturated buffers** divert 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.



Groups	Treatments	Information Treatments Details
Group 1	A fact sheet	We presented recipients with an online two-page fact sheet on environmental benefits 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 ISU extension professional.
Group 3	A video by an early farmer adopter	We presented recipients with a 2-min educational video by an early farmer adopter.
Group 4	Control group	We presented recipients only the survey questionnaire.

## 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:

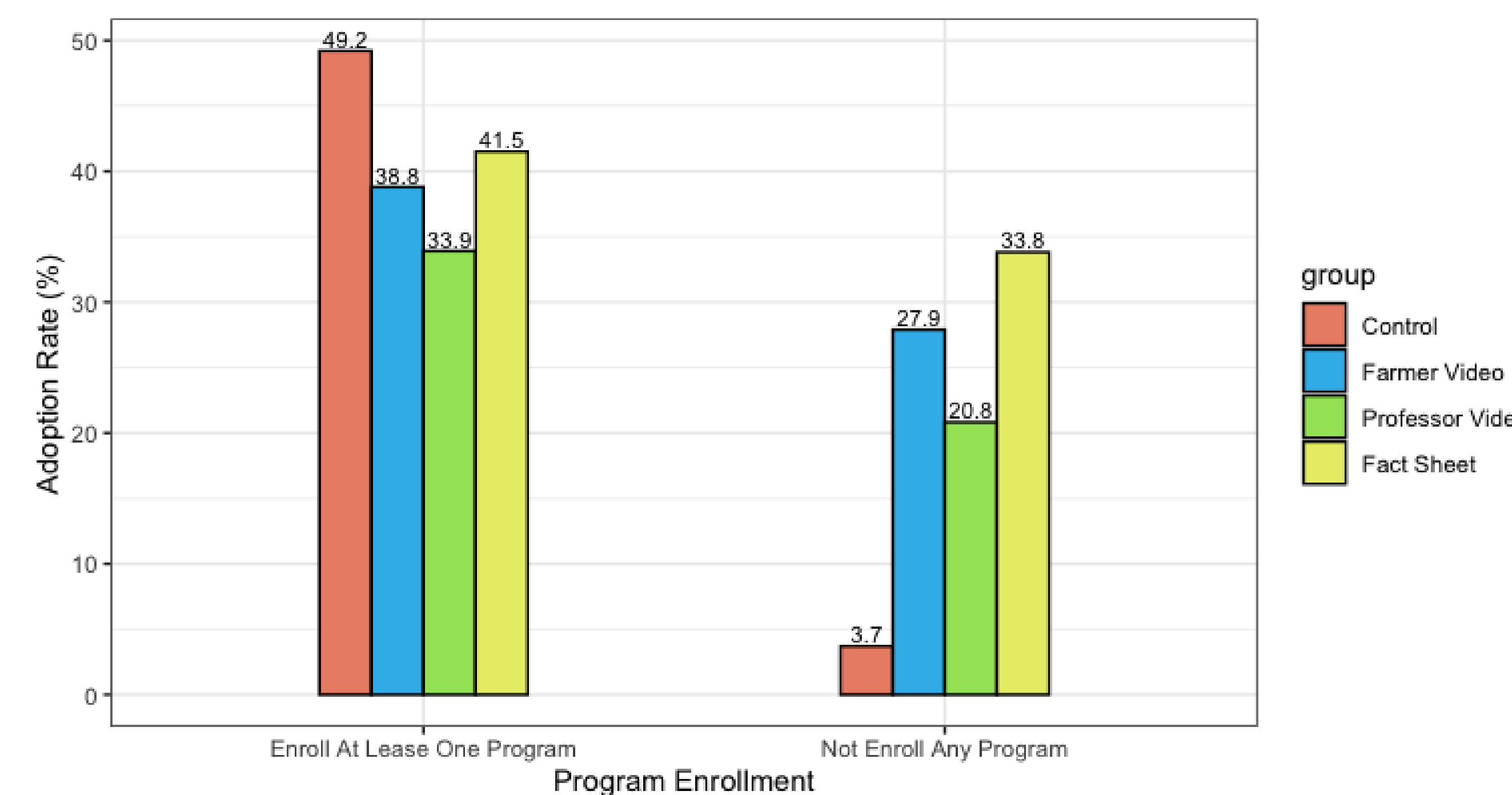
$$P_{ij} = e^{V_{ij}} / (1 + e^{V_{ij}}),$$

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

$$V_{ij} = \beta_1 Factsheet_i + \beta_2 Farmer_i + \beta_3 Extension_i + \alpha X_i + \delta Z_{ij} + \mu_k$$

where

- ▶  $X_i$  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;
- ▶  $Z_{ij}$  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;
- ▶  $\mu_k$  denotes a fixed spatial effect.



## Results

Demographics	Group N		Group E		p-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 <sup>1</sup>	0.27	0.44	0.37	0.48	0.01
College <sup>2</sup>	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

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

Note: \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

## Conclusions

- ▶ Information treatments are effective for farmers with little conservation experience (Group N).
- ▶ The fact sheet is the most effective treatment, followed by the farmer video, then the professional video.
- ▶ Farmers with conservation experience (Group E) are more sensitive to cost-share payment. With higher payment, the adoption rate is higher.