

# Landowners' preferred communication channels, motivations, and barriers to adopting best management practices

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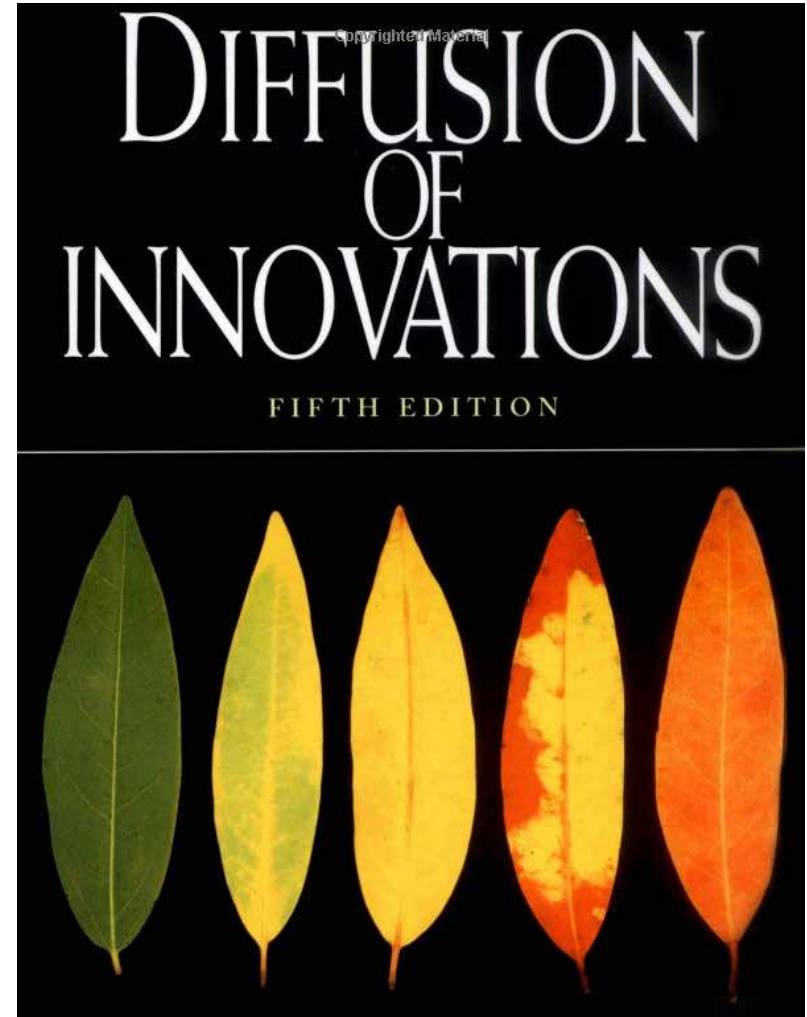
# Outline

- ✧ Rodgers, 2003 - Diffusion of Innovations
- ✧ Little River, San Gabriel River, and Big Elm Creek Watersheds
- ✧ Objectives
- ✧ Results
- ✧ Conclusions

# Diffusion of Innovations

- ⌘ Four main elements:
  - 1) An innovation is
  - 2) Communicated through certain channels
  - 3) Over time
  - 4) Among members of a social system

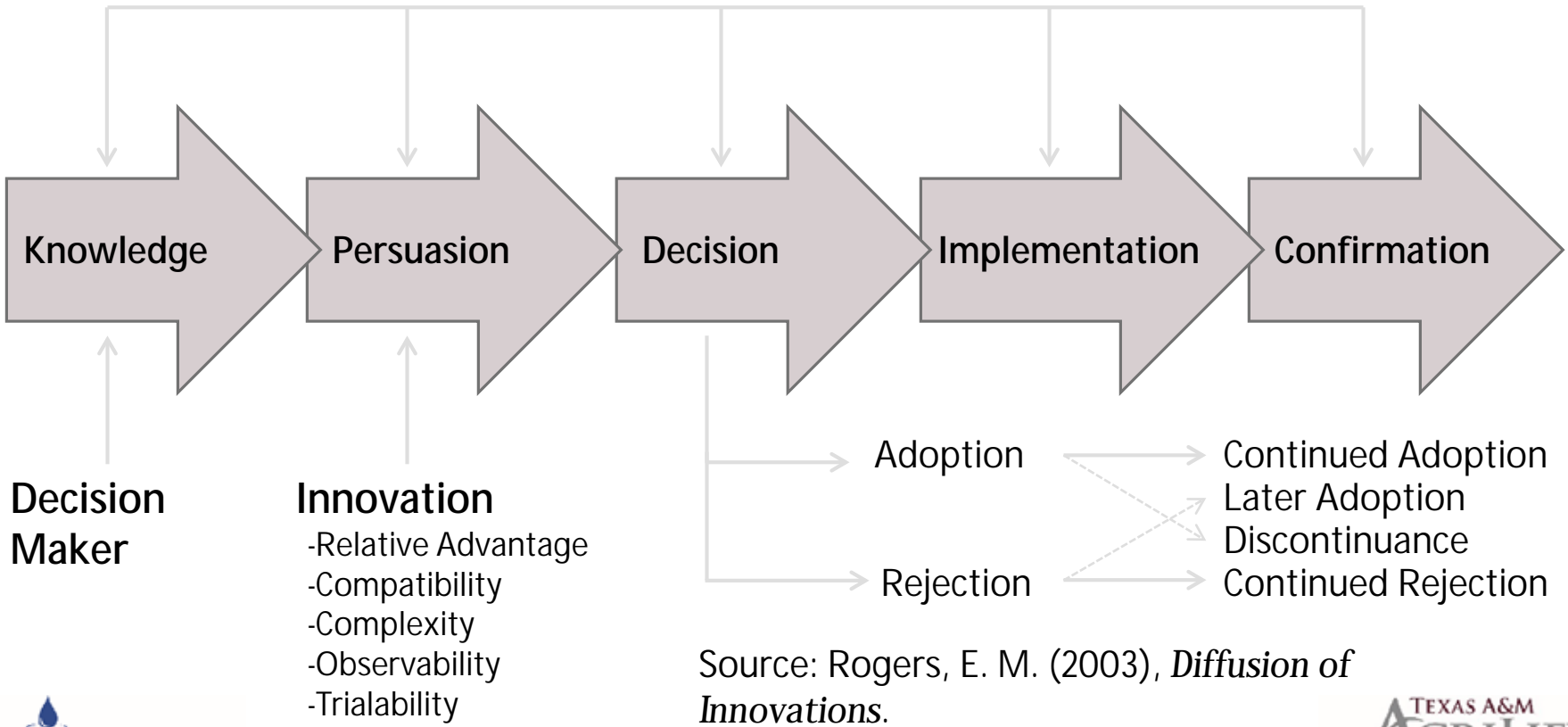
Source: Rogers, E. M. (2003), *Diffusion of Innovations*.



# Innovation-Decision Process

- Prior Conditions**
1. Previous practice
  2. Needs/problems
  3. Innovativeness
  4. Social norms

## Communication Channels



Source: Rogers, E. M. (2003), *Diffusion of Innovations*.

# Knowledge - Ranks of Communication Channels

## Rank order of information sources

	Knowledge	Persuasion	Decision
1 <sup>st</sup>	Mass Media	Friends & neighbors	Friends & neighbors
2 <sup>nd</sup>	Friends & neighbors	People in public service	People in public service
3 <sup>rd</sup>	People in public service	Dealers or salespeople	Mass Media
4 <sup>th</sup>	Dealers or salespeople	Mass Media	Dealers or salespeople

## Where do Americans place their confidence?

52%	Citizens like you
44%	Education professionals
29%	Non-government community leaders
24%	Local media
16%	Federal government
11%	Representatives of political parties

Source: Dr. Murphrey's TAMU  
ALEC 640 course

# Persuasion - Elements of an Innovation



## Relative Advantage

Degree to which better than idea it replaces



## Observability

Degree to which results can be observed by others

Degree of difficulty in understanding and use



## Complexity

Degree to which consistent with values, experiences, and needs



## Compatibility

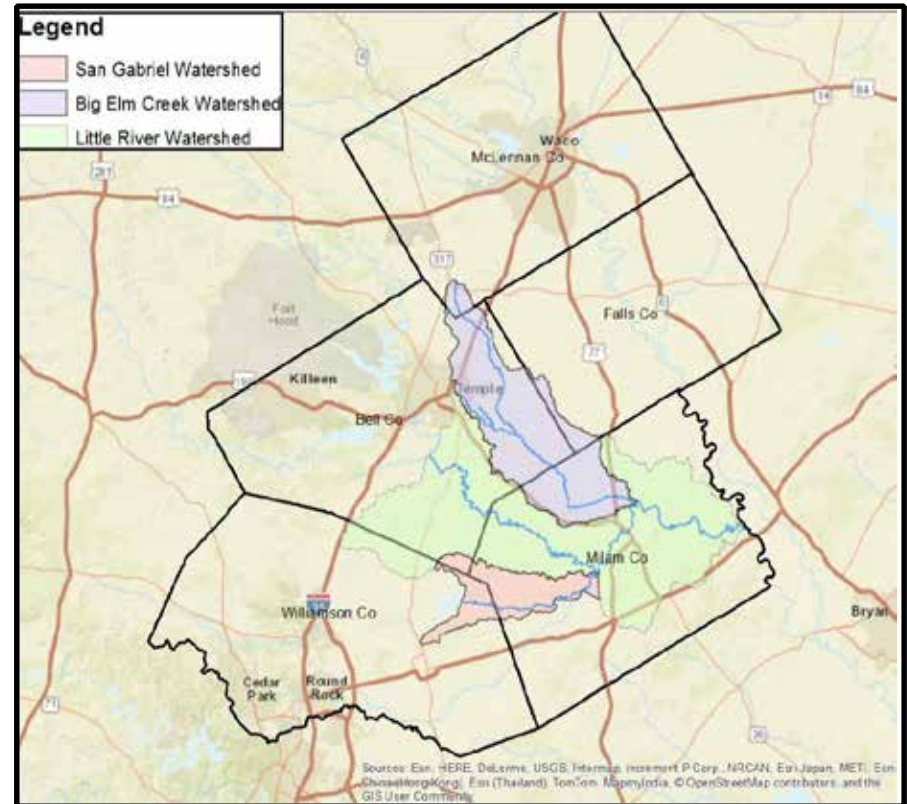
Degree to which limited experimentation is possible



## Trialability

# The Little River and Friends Watersheds

- ⌘ Watershed Characterization
- ⌘ Names and Addresses acquired from CADs
  - ⦿ GIS clip to watersheds and outside city limits
  - ⦿ Population – 7,592
  - ⦿ Sample – 1,881
  - ⦿ 462 responses (25%)
  - ⦿ 275 usable responses (15%)



# Objectives

- ✧ Communication
  - How do landowners prefer to receive information
  - What sources of information do landowners trust
  - What types of information do landowners wish to receive
  
- ✧ Practice adoption
  - Factors that motivate landowners to adopt practices
  - Barriers that keep landowners from adopting practices
  
- ✧ Responses broken out into agricultural and non-agricultural producers and tested for differences in means (no differences found do to Bonferroni corrected test value)



# Demographics

Table 1

Agricultural and Non-agricultural Landowners' Demographic Characteristics (N = 254)

Characteristics	Agricultural		Non-agricultural	
	f	%	F	%
<b>Age</b>				
40 or younger	2	1.9	1	0.8
41 to 50	12	11.3	6	4.5
51 to 60	35	33.0	30	22.6
61 to 70	33	31.1	46	34.6
71 to 80	17	16.0	36	27.1
81 or older	7	6.6	14	10.5
<b>Gender</b>				
Male	80	74.8	90	65.2
Female	27	25.2	48	34.8
<b>Ethnicity</b>				
American Indian	0	0.0	1	0.8
Asian	0	0.0	0	0.0
Black or African American	3	2.9	11	8.3
Caucasian	98	96.1	119	89.5
Native Hawaiian or Pacific Islander	0	0.0	0	0.0
Spanish, Hispanic, Latino	1	1.0	2	1.5
<b>Highest level of education</b>				
Less than high school	3	2.8	2	1.5
High school diploma/GED	22	20.8	21	15.3
Some college	18	17.0	26	19.0
Two-year degree	13	12.3	13	9.5
Bachelor's degree	29	27.4	32	23.4
Graduate degree	19	17.9	39	28.5
Other	2	1.9	4	2.9

# Communication Channels

**Table 2**  
**Agricultural and Non-agricultural Landowners' Preferred Communication Channels for Receiving Water-related Information (N = 254)**

Communication Channel	Agricultural			Non-agricultural			df	t	p	Cohen's d
	M	SD	n	M	SD	n				
Direct mailings	3.99	1.06	89	4.00	1.23	106	193	-0.067	.946	.01
Websites	3.20	1.45	87	3.18	1.41	105	190	0.070	.944	.04
Email	3.08	1.53	88	3.07	1.56	104	190	0.055	.957	.01
Newspaper	2.67	1.24	86	2.90	1.40	105	189	-1.192	.235	.17
Television	2.66	1.31	87	2.87	1.33	107	192	-1.121	.264	.16
Magazines	2.88	1.28	86	2.61	1.29	100	184	1.451	.148	.21
Radio	2.38	1.25	82	2.40	1.23	99	179	-0.140	.888	.02
Books	2.33	1.22	82	2.65	1.24	100	180	-1.749	.082	.26
Social media	1.93	1.16	83	1.94	1.02	100	181	-0.073	.942	.01

Note. N = total respondents who participated in the study. n = total participants who answered the question. ≤ 1.50 = least preferred; 1.51 – 2.49 = slightly not preferred; 2.50 – 3.49 = no preference; 3.50 – 4.49 = slightly preferred; 4.50 ≤ = most preferred

# Communication Frequency

Table 3

Agricultural and Non-agricultural Landowners' Reported Frequency of Receiving water-Related Information (N=254)

Communication Channel	Agricultural			Non-agricultural			df	t	p	Cohen's d
	M	SD	n	M	SD	n				
Direct mailings	3.46	1.30	94	3.30	1.40	120	212	0.842	.401	.12
Websites	3.02	1.67	91	2.56	1.65	112	201	1.958	.052	.28
Email	2.93	1.62	94	2.61	1.68	116	208	1.372	.173	.19
Newspaper	2.74	1.01	89	2.70	1.68	112	199	0.193	.847	.02
Magazines	2.72	1.51	90	2.20	1.55	110	198	2.401	.017	.34
Television	2.68	1.66	92	2.54	1.64	113	203	0.625	.533	.08
Radio	2.30	1.62	87	2.05	1.55	110	195	1.115	.266	.16
Social Media	1.85	1.45	87	1.56	1.23	107	192	1.506	.134	.22
Books	1.78	1.18	89	1.64	1.61	107	194	0.835	.405	.12

Note.  $\leq 1.50$  = Never; 1.51 – 2.49 = Annually; **2.50 – 3.49 = Twice Annually**; 3.50 – 4.49 = Quarterly; 4.50  $\leq$  = Monthly

# Communication Sources

Table 4

Agricultural and Non-agricultural Landowners' Perceived Communication Source Trustworthiness (N=254)

Information Source	Agricultural			Non-agricultural			df	t	p	Cohen's d
	M	SD	n	M	SD	n				
Texas A&M AgriLife Extension	3.18	0.76	80	3.12	0.88	78	156	0.456	.649	.07
Texas Parks and Wildlife	2.92	0.85	73	2.82	0.86	73	144	0.681	.497	.12
Industry groups	2.76	0.80	79	2.65	0.79	77	154	0.862	.390	.14
Government agencies	2.66	0.86	83	2.58	0.87	83	164	0.628	.531	.09
Friends and neighbors	2.45	0.82	76	2.40	0.79	75	149	0.361	.719	.06
County health department	2.42	0.91	66	2.48	0.74	69	125.14	-0.379	.707	.07
Agricultural service providers	2.33	0.80	73	2.18	0.75	68	139	1.162	.247	.19
Trade shows/fairs	2.14	0.80	66	2.15	0.77	66	130	-0.111	.912	.01
Environmental groups	1.83	0.93	70	2.07	0.86	67	135	-1.605	.111	.27

Note.  $\leq 1.50$  = not trustworthy; 1.51 – 2.49 = somewhat trustworthy; 2.50 – 3.49 = trustworthy;  $3.50 \leq$  = very trustworthy.

# Familiarity with BMPs

Table 5

**Agricultural and Non-agricultural Landowners' Familiarity with Identified BMPs (N=254)**

BMPs	Agricultural			Non-agricultural			df	t	p	Cohen's d
	M	SD	n	M	SD	n				
Soil testing	2.30	0.63	107	1.90	0.72	127	232	4.482	.00	.59
Pesticide management	2.28	0.73	104	1.86	0.73	121	223	4.284	.00	.57
Terraces	2.27	0.76	105	1.90	0.79	124	227	3.523	.001	.48
Wildlife management	2.04	0.65	106	1.73	0.70	127	228.3	3.471	.001	.46
Retaining crop residue on soil surface	2.04	0.80	101	1.58	0.73	126	225	4.524	.00	.60
Conservation tillage (no-till, strip-till)	2.02	0.73	103	1.71	0.72	125	226	3.203	.002	.43
Nutrient management	1.99	0.76	103	1.57	0.69	122	223	4.383	.00	.58
Approved grazing management plan for livestock	1.92	0.72	104	1.55	0.68	125	227	4.011	.00	.53
Fencing around riparian areas for rotational grazing	1.77	0.74	103	1.66	0.75	123	224	1.091	.276	.15
Variable rate application technology	1.60	0.72	102	1.27	0.53	124	181.5	3.772	.00	.52
Riparian management	1.52	0.72	105	1.34	0.63	117	208	1.988	.048	.27

Note.  $\leq 1.50$  = Not at all familiar; 1.51 – 2.49 = Somewhat familiar;  $2.50 \leq$  = Very familiar.

# Motivators for Adopting BMPs

Table 8

Motivators for Agricultural and Non-agricultural Landowners Adopting BMPs (N= 254)

Factors	Agricultural			Non-agricultural			df	t	p	Cohen's d
	M	SD	n	M	SD	n				
Improve/maintain the environment for future generations	4.26	0.81	102	4.12	1.04	116	216	1.131	.259	.15
Personal values and connection with the land	4.25	0.86	104	4.02	1.01	117	219	1.734	.084	.23
Increase property value	4.15	0.88	104	3.95	1.14	199	221	1.231	.133	.20
Improve wildlife/fish habitat	4.11	0.88	104	3.88	1.13	116	218	1.669	.097	.23
Improve scenic beauty	4.05	0.93	103	3.87	1.93	117	218	1.231	.220	.17
Pride of conserving land by implementation	4.00	0.94	101	3.88	1.02	116	215	0.901	.369	.12
Concern for neighbor's land	3.96	0.88	104	3.77	1.06	117	219	1.471	.143	.17
Economical profitability of the practice	3.76	0.93	103	3.64	.98	113	214	0.919	.359	.13
Landowners success with implementing practices	3.66	0.85	101	3.69	1.07	114	213	-0.225	.822	.03
Relatability of practice to current management situation	3.59	0.86	103	3.45	.98	110	211	1.159	.248	.51
Cost-share programs to off-set cost of implementation	3.36	1.12	105	3.39	1.09	115	218	-0.197	.844	.07
Personal recognition of implementing practices	3.24	1.53	102	3.25	1.03	113	213	-0.084	.933	.01
Loans to help ease the cost of implementation	3.16	1.02	104	3.03	1.10	114	216	0.953	.342	.12

Note.  $\leq 1.50$  = strongly disagree; 1.51–2.49 = disagree; 2.50–3.49 = somewhat agree; 3.50–4.49 = agree;  $4.50 \leq$  = strongly agree.

# Barriers to Adoption

Table 9

## Barriers to Agricultural and Non-agricultural Landowners Adopting BMPs (N= 254)

Factors	Agricultural			Non-agricultural			df	t	p	Cohen's d
	M	SD	n	M	SD	n				
Unsure of government regulations and rules	3.85	0.93	96	3.63	1.06	103	197	1.577	.116	.22
Lack of information about practice effectiveness	3.72	0.92	95	3.63	1.04	103	196	0.606	.545	.09
Lack of information about incentive programs	3.72	1.07	97	3.60	1.14	105	200	0.781	.436	.11
Initial cost of implementation	3.67	0.96	94	3.53	1.10	103	195	0.924	.357	.14
Lack of opportunities to see demonstrations	3.66	0.88	95	3.50	0.98	101	194	1.262	.208	.17
Low incentive (cost-share) levels	3.63	0.99	93	3.29	1.08	95	186	2.249	.026	.33
Maintenance costs	3.61	0.10	96	3.46	1.06	102	196	1.098	.273	.15
Lack of support from agencies/organizations when implementing practices	3.54	0.97	96	3.20	1.04	92	186	2.357	.019	.34
Uncertain that the practice will increase or decrease production profits	3.52	0.88	94	3.31	0.96	98	190	1.623	.106	.23
Terms of program contract	3.40	0.94	91	3.15	0.96	92	181	1.732	.085	.26
Belief that adopting a practice will not make a difference	2.93	1.01	96	2.92	1.08	100	194	0.047	.962	.01
Land does not meet the requirements	2.75	1.03	89	3.16	1.09	95	182	-2.599	.010	.42
Not willing to change current land management practices	2.73	1.02	94	2.92	1.14	103	195	-1.221	.223	.18
Unsure of what neighbors would think	2.25	1.01	92	2.52	1.09	99	189	-1.737	.084	.26

Note.  $\leq 1.50$  = strongly disagree; 1.51–2.49 = disagree; 2.50–3.49 = somewhat agree; 3.50–4.49 = agree;  $4.50 \leq$  = strongly agree

# Conclusions

- ✘ No significant differences between agricultural producers and non-ag producers
  
- ✘ Knowledge – Communication Strategy
  - Communication Channels
    - Need to **push** information **twice annually** landowners and can include links to website with additional information
    - Most trusted sources are TAMU AgriLife, TPWD, and Industry Groups
    - Education materials should focus on grazing management practices and riparian management



# Conclusions Continued

## ✧ Persuasion

### ◎ Motivations and Barriers

- ◎ Education materials should focus how BMPs improve property for various purposes (future generations, raise value, wildlife habitat, etc.)
- ◎ Education materials should highlight costs and benefits of practices as well as information about financial assistance programs available
- ◎ Need for demonstrations

# Questions?

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