

# Barriers to Adoption of Nutrient Management Strategies by AFOs: Preliminary Results

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# Why?

- Need voluntary adoption by AFO's to solve water quality problems
- Better understanding of the barriers to adoption is needed to
  - Design better technologies/practices
  - Improve extension and educational programs
  - Design effective policies

# Current CSREES Project

- Research objectives of survey
  - Examine role of off-farm income in adoption (+ or -, why)
  - Determine effect of land rental arrangements
  - Characterize manure markets
  - Identify determinants of adoption of “environmental” innovations compared to ones that are adopted to increase profits

# Methods

- Survey was designed and implemented using Dillman 2000.
- Final survey was conducted in March 2006
- Recipients chosen at random after stratification by size and livestock type
- Farms with sales less than \$10,000 were not surveyed
- Effective response rate was 37%
- Data entry finished in summer 2006
- Analysis is on-going.

# Preliminary Results

- Poster developed by Jessica Amidei regarding manure sales/transfers
- Average acres owned (other than for those with pasture only operations) 330
- Average acres rented from others was 273
- 59% of respondents apply manure or litter to land that they rent from others.
- 5% of those that apply manure indicated there are clauses that specify manure application practices.

# Programs

- 54% were aware of EQIP (higher than two years ago)
- Of those, 48% had applied for EQIP
- 34% of those that were aware of the program had an EQIP contract
- CSP questions were deleted from the survey since awareness was so low in pretest
- 24% have an NRCS approved CNMP

# Attitude questions

- 17% agree that the smell of manure bothers them or their family (vs 23% for neighbors)
- 21% agree it's difficult to know how much manure to apply
- 12% say it is difficult to know how crops respond compared to commercial fert.
- 78% are concerned about WQ in their county and 81% say that properly managing manure improves water quality (but this isn't translated in to adoption behavior).

# Influence on ag decisions

## ■ % who indicated a group had the most influence

■ NRCS	24%
■ Other farmers	16%
■ Banks	16%
■ Contractors	13%
■ Other govt.	12%
■ University*	11%
■ Non-farming neighbors	8%

\*did not mention Extension

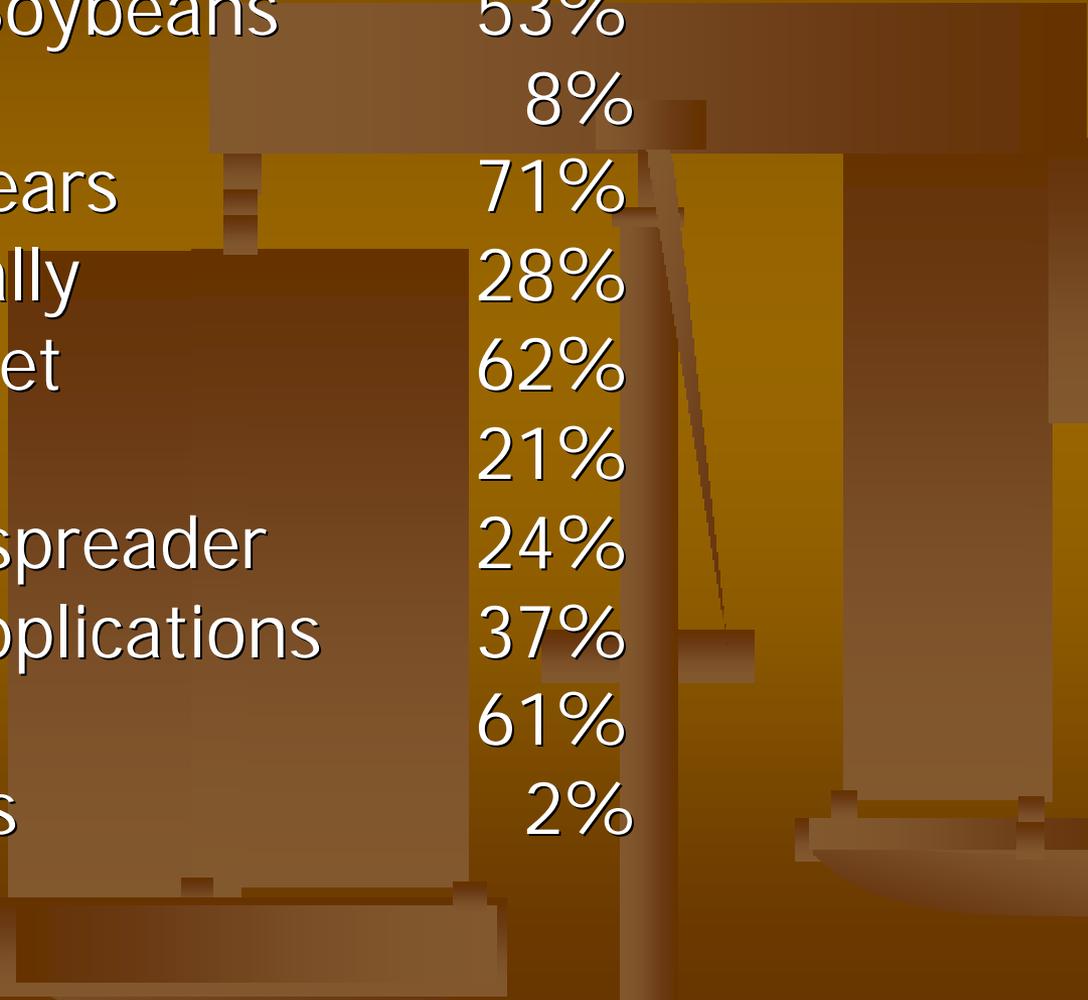
# Profitability/ Improves WQ Perceptions

■ Round-up Ready Soybeans	3.85	3.38
■ Phytase	2.81	3.03
■ Soil test every 3 years	<b>4.17</b>	4.02
■ Manure test annually	3.44	3.59
■ Setbacks of 100 feet	3.37	<b>4.36</b>
■ Inject manure	3.51	3.87
■ Calibrate manure spreader	3.42	3.51
■ Keep records of applications	3.34	3.46
■ Grass filters	3.55	4.33
■ Underground pipes	<b>2.72</b>	<b>2.96</b>

# Time Consuming/Complicated

■ Round-up Ready Soybeans	1.88	1.80
■ Phytase	2.58	2.60
■ Soil test every 3 years	2.97	2.30
■ Manure test annually	3.05	2.66
■ Setbacks of 100 feet	2.47	2.22
■ Inject manure	3.26	2.81
■ Calibrate manure spreader	3.24	3.03
■ Keep records of applications	3.57	3.06
■ Grass filters	2.79	2.48
■ Underground pipes	3.23	3.25

# Crude Adoption Rates



■ Round-up Ready Soybeans	53%
■ Phytase	8%
■ Soil test every 3 years	71%
■ Manure test annually	28%
■ Setbacks of 100 feet	62%
■ Inject manure	21%
■ Calibrate manure spreader	24%
■ Keep records of applications	37%
■ Grass filters	61%
■ Underground pipes	2%

# Adoption rates for manure testing

Sales (with crops)	Dairy n=178	Beef Cattle n=182	Beef Cow n=129	Swine n=241	Broiler n=62	Turkey n=98
\$10,000 - \$99,999	8.11	12.50	4.26	36.36	0.00	16.13
\$100,000 - \$249,999	16.07	4.08	5.00	52.50	48.00	37.21
\$250,000 - \$499,999	34.15	15.63	7.14	54.76	46.67	55.56
\$500,000 +	70.37	24.32	0.00	63.41	33.33	71.43

# Does off-farm work interfere with timing of operations? (by gross farm sales)



■ \$10,000-99,999	26%
■ \$100,000-249,999	19%
■ \$250,000-499,999	13%
■ >\$500,000	7%

# Tentative conclusions from regression analyses

- CAFOs generally adopt manure management practices (excluded from subsequent regressions)
- Age negatively associated with adoption, except for record keeping
- Education doesn't have a consistent effect
- Adoption levels higher with more animal units (for non-CAFOs)

- Agreement that the smell of manure bothers them is associated with lower adoption of manure testing
- Those with solid manure systems were less likely to adopt practices than those with liquid systems
- Factors that affect adoption depend on the practice (to be continued)

- This project is partially funded by a USDA-CSREES Integrated Research, Extension and Education 406 Project
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