Factors Affecting Adoption of Agricultural Best Management Practices in Iowa

Introduction

- Excess Nitrogen and Phosphorus from agricultural land pollutes water in Iowa.
- Best Management Practices (BMPs), such as wetlands, cover crops, and nutrient management can reduce nutrient export from agricultural land.
- Iowa lags behind other states in BMP adoption despite known benefits.

Objectives

1. Determine the major factors affecting BMP adoption in Iowa.
2. Synthesize available research to gain new insight and identify research gaps.

Methods

- Systematic Literature Review
- CAB, AGRIS, ERIC, and ACSESS databases searched for academic literature.
- "Gray Matter" literature identified and reviewed.
- Literature restricted by criteria: date, language, location, and content.

Major Factors

- Farm Finances
- System Economics
- Knowledge

Moderate Factors

- Social
- Attitudes
- Change
- Risk

Minor Factors

- Scale
- Visibility
- Commit
- Age

A complex mix of factors affect BMP adoption nationally and in Iowa.

Results

- Themes identified from the literature and grouped into major, moderate, and minor factors (Figure 4).
- Some factors appeared as expected: financial, economic, knowledge, age, and systemic resistance to change.
- Unexpected factors: social issues, visibility of farm and practices, and scale—relating to farm size and BMP size.
- Factors positively associated with adoption:
  - Adequate knowledge of practice.
  - Financial incentives.
  - Strong social networking.
  - Highly visible practices.
- Factors negatively associated with adoption:
  - Farmers lacking knowledge of practice.
  - Current system economics (e.g., lack of markets for alternative crops).
  - Resistance to change—ingrained "culture".
  - Inadequate communication—between researchers, extension, industry, and farmers.
  - Less visible practices.
- Current BMP development research focuses on BMP in isolation—but it is integrated into complex farming system in practical use.

Conclusions

- No single factor affects BMP adoption.
- The current agricultural system in Iowa may limit adoption due to market limits and declining farm profits.
- The increasing age of farmers in Iowa may limit adoption.
- To improve adoption, communication of research and BMP implementation should be targeted to the specific audience or sites.
- To improve adoption, the outcomes need to be clear and include practical benefits and visible results for the farmer.
- Future research should focus on risk management and ways to encourage system-wide changes.

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Credits: Figure 1 – USGS (public domain), Figure 2 – Denitrifying Wetland, Figure 3 – Keywords for literature search, Figure 4 – Relative proportions of adoption factors found in literature, Figure 5 – Iowa Net Farm Income ($ per operation), Figure 6 – Iowa Farmland Ownership by Age, Figure 7 – Contour Buffer Strips.