Nitrogen Decision Making Under Uncertainty: Role of Subjective Beliefs

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Nitrogen Decision Making Under Uncertainty: Role of Subjective Beliefs

**Objectives**

- Study the role of subjective beliefs in the Nitrogen decision process.
- Analyze how farmers' subjective beliefs influence their Nitrogen management practices.
- Evaluate the potential drivers that shape farmers' subjective beliefs about Nitrogen response and rainfall.

**Background**

Objective benchmark measures are built from Hydrologic Evaluation of Landfill performance (HELP) in acres, Size in acres, Nitrogen application requirement and timing and method of HEL in Central Iowa. Subjective beliefs about Nitrogen management are collected through a survey in early June 2014 among 75 farmers in central Iowa. Primary data on subjective beliefs regarding Nitrogen decision making is collected using tools from Behavioral Economics and Psychology. Expected Yield following different levels of Nitrogen application and varying levels of rainfall is the finding of the study. The study is conducted to understand subjective beliefs and their impact on Nitrogen decision making. The 2008 Action Plan of EPA in order to control hypoxia in the Gulf of Mexico has mandated the states along Mississippi River to develop Nitrogen reduction policies.

**Data & Methodology**

Subjective Beliefs are measured using tools from Behavioral Economics and Psychology. Expected Yield following different levels of Nitrogen application and varying levels of rainfall is the finding of the study. The study is conducted to understand subjective beliefs and their impact on Nitrogen decision making. The 2008 Action Plan of EPA in order to control hypoxia in the Gulf of Mexico has mandated the states along Mississippi River to develop Nitrogen reduction policies.

**Results**

Summary statistics reveal the following:

- Significant positive skewness of Subjective Rainfall Beliefs and Subjective Yield Skewness (SuYield) across different levels of rainfall and crops.
- farms decision making involves subjective beliefs about Yield response, rainfall beliefs and underlying nitrogen beliefs.
- The objective of this study is an attempt to characterize the farmers’ subjective beliefs to Nitrogen decision making.
- Preliminary findings support heterogeneity of farmers’ beliefs.
- Farmers potentially biased about their Nitrogen beliefs.
- Evidence of Pessimism Bias in the growing season.
- Why Subjective Beliefs?

**Conclusions**

- The performance of normal expectations is at the core of Nitrogen decision making.
- Evidence of subjective Beliefs can negatively skewed at high nitrogen levels, the findings do not support them. In contrast to standard literature on Yield and Actual Rainfall Distributions.
- Subjective beliefs are measured using tools from Behavioral Economics and Psychology. Expected Yield following different levels of Nitrogen application and varying levels of rainfall is the finding of the study. The study is conducted to understand subjective beliefs and their impact on Nitrogen decision making. The 2008 Action Plan of EPA in order to control hypoxia in the Gulf of Mexico has mandated the states along Mississippi River to develop Nitrogen reduction policies.