

Promoting best management practices in agriculture: Using traditional and heterogeneous preference approaches to inform water quality policy in the midwestern United States

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ABSTRACT: A recent increase in the amount of dissolved reactive phosphorus (DRP) entering the western Lake Erie basin is likely due to increased spring storm events in combination with the broadcast application of nutrients (among other agricultural practices). These factors in combination with warmer lake temperatures have amplified the spread of toxic algal blooms. An increase in practices that improve soil health, increase nutrient management precision, and control subsurface drainage may be a solution to this ongoing issue. We assessed the willingness of farmers in the Maumee watershed to take at least one additional action to reduce nutrient loss on their farm, identifying to what extent farm and farmer characteristics as well as higher-order cognitions increased this willingness, and assessed how these factors differ in their predictive ability based on predetermined observable classes and unobservable latent classes of farmers. Risk perception was the most consistent predictor of willingness. Further, response efficacy was found to significantly influence willingness, although the importance of this belief was particularly salient for older farmers and those motivated by profit. General communication and outreach efforts should focus on the negative impacts to both the farm and the natural environment to raise individual perceived risk, while older farmers need higher coping appraisals or more specific information about the effectiveness of BMP adoption. Furthermore, efficacy barriers for the minority class of older farmers may point to a need for enhanced structural fixes (e.g., regulation, incentives) to motivate those who are less willing to take additional action.