

**Nebraska Conventional Farmers' Perspectives Toward Agricultural Hemp**

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## Introduction

In 2019, Nebraska legalized hemp cultivation and a total of 84 licensed farmers made the decision to grow the crop the following year (Nebraska Department of Agriculture, 2020). The state report indicated that there were significant challenges for farmers as they navigated the new crop and regulatory process. Despite these challenges, Adesina et al. (2020) described a growing demand for hemp that will give rise to more opportunities for farmers, thereby increasing the number of farmers pursuing hemp cultivation in future years. However, farmers' future hemp adoption, and the speed in which adoption will occur, will be impacted by farmers' knowledge and perceptions toward the newly legal crop. The purpose of this research was to explore Nebraska conventional farmers' perceptions toward hemp cultivation. We focused on three overarching research questions: 1) How do conventional farmers' perceive hemp in relation to the characteristics of an innovation (as described by Rogers, 2003)?; 2) What advantages and disadvantages do conventional farmers identify with hemp cultivation?; and, 3) What attitudes and behavioral intentions do conventional farmers hold toward incorporating hemp in their future agricultural operations?

## Theoretical Framework

Huyge et al. (2016) described the importance of social science research to catalyze the diffusion of innovation and knowledge in agriculture to improve the sustainability of the industry. The theoretical framework used to guide this study was the Diffusion of Innovations Theory. According to Rogers (2003), the Diffusion of Innovations Theory can be used to describe how a new product, service, or innovation transfers through an industry. The Diffusion of Innovations Theory has previously been used to describe technology adoption in industry (Grover et al., 2019), and is well suited as a theoretical framework to guide the adoption of hemp as a newly legalized crop in the United States. The population adopting the innovation can be characterized as innovators (the first 2.5% of a population), followed by early adopters (13.5%), early majority (34%), and late majority (34%). The last 16% of the population adopting the innovation are characterized as laggards. Since the adoption of hemp is relatively new, our study focused on those who have not adopted hemp (i.e., all but the earliest of 'innovators'). Furthermore, the speed of adoption of a new innovation can be linked to its perceived attributes. Rogers (2003) described these attributes as: 1) relative advantage; 2) compatibility; 3) complexity; 4) trialability; and, 5) observability.

## Methodology

Purposive sampling (Frey, 2018) was used to recruit seven conventional farmers in Nebraska who were not growing hemp in the 2020 season. We defined conventional farmers as those whose operations consisted of using synthetic fertilizers, pesticides, and genetically engineered crops in large-scale corn and soybean production operations. We conducted a series of one-on-one interviews using a semi-structured interview guide to obtain data related to our research questions. The interview guide consisted of four areas and 13 questions, mainly constructed in alignment with the five attributes to an innovation as described by Rogers (2003). Member checking (Lincoln & Guba, 1985) was used to improve the accuracy and completeness of the information and to account for credibility. Interviews were later transcribed and coded via a codebook established prior to the interviews. Using deductive coding methods, the two researchers coded each transcript and compared results to make adjustments. The two coders then worked together to analyze and discuss coded data to identify emerging themes. This study was approved by the Doane University Institutional Review Board (#F20 017 DC IRB HS) and pseudonyms were used to maintain participant anonymity.

## Results

Seven conventional farmers, six males and one female, were interviewed for this study. All seven participants were Nebraska farmers who practiced conventional row-crop production. Participants ranged from 25 to 69 years of age and a majority were a part of multigeneration farms. Farmers' size of operation generally mirrored the average Nebraska farm size, and varied between 700 and 3,000 acres. Four themes emerged from this research and are presented below.

**Limited Exposure.** A majority of the participants revealed a significant lack of knowledge and limited exposure to hemp cultivation. For example, Brandon stated, "It's not something that's really been discussed throughout area FSA [Farm Service Agency] and places like that so I don't know about the ramifications, or the financial ramifications...it's just a lot of unknowns for me."

Three farmers had general, but limited, knowledge on hemp. Dan stated, "I don't know much about the harvesting part and the equipment it entails but the articles I have read, it seems to be fairly cost productive." Only two participants had previously observed hemp being grown, and those individuals observed hemp as an agricultural pest. For example, Sam described, "I know they're the old style hemp weeds ... we've fought them forever, trying to get rid of them."

**Technical Challenges.** None of the participants had the perception that growing hemp would be an easy task. Most participants perceived there to be challenges with hemp cultivation. Zach stated, "It seems decently complex. Just the new thing to learn and then probably different equipment to grow it." Rick described technical challenges related to machinery and pesticides. He stated, "The main challenge is the equipment, knowing how and when to [use it] ... and the chemicals it takes."

**Opportunities.** Overall, all the participants agreed that there are some opportunities with growing hemp, including economic and environmental benefits. Dan claimed, "if it actually becomes popular, I think that [crop] diversification might become more appealing to some people." William believed that hemp will help take stress off the corn market and said, "I think if there are less acres of corn, I'll get a better price, [assuming] they put hemp on theirs."

**Impartial Feelings.** All participants had impartial feelings toward hemp. Brandon said, "If there is a niche available, [and] if it works for a person I guess then that's great." Several farmers perceived hemp to be illegal, confusing hemp with marijuana. However, they still held impartial feelings regarding the crop. Darlene stated, "I just feel if we were to legalize [hemp], it would create more problems with the law and people abusing it." Darlene continued by saying, "if hemp isn't for recreational use then it's fine." All but one participant stated that they have not considered growing hemp in the past nor would they consider growing hemp in the future.

### Conclusions, Implications, and Recommendations

The results of our qualitative study indicated that our Nebraska conventional farmers had limited knowledge about hemp and hemp cultivation. Some farmers held misconceptions about hemp and associated it with marijuana. None-the-less, farmers believed there to be opportunities and benefits toward growing hemp, but the technical challenges outweighed those benefits, leaving farmers to believe they would never grow hemp themselves. Interestingly, farmers were impartial if others grew hemp. This research identified a clear gap in farmer knowledge.

Educational programs for conventional farmers to learn about and observe hemp cultivation are sorely needed for successful, wide-spread hemp adoption. Furthermore, research and development to address technical challenges (e.g., pesticides, machinery, regulation) and to improve the compatibility of hemp in conventional farming operations is needed. Future social science research should be conducted to better understand and address the misconceptions between hemp and marijuana that are present even in our farming communities.

## References

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