
Statement of Research Philosophy

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I grew up in a rural farming community in Iowa where uncertainty in agricultural production and marketing influenced family and friends on a daily basis. I have witnessed the joy a mid-summer rain can bring in the midst of a dry spell, the frustration and worry caused by an early fall frost, and the confusion and concern created by new Farm Bill legislation. Consequently, I have always been intrigued by the choices farmers make to address uncertainty in their operations, whether it be through diversification, crop insurance, forward contracting, new technologies, or alternative farming practices. Due to the personal connection I feel to farming, my passion lies in helping farmers make decisions that will lead to better risk management and more efficient farming operations.

I am particularly interested in researching how individuals within the agricultural supply chain use contracts to manage risk and align incentives. My dissertation focuses on the use of colony strength requirements in California almond pollination contracts as a key mechanism for almond growers to mitigate uncertainty and moral hazard issues in procuring managed honey bee colonies for pollination services—an essential input to almond production. “Colony strength” corresponds to the approximate number of bees in a colony of honey bees and is used in the almond pollination market as an estimate of the pollination potential of a colony, i.e., a colony with high colony strength will likely pollinate more almond blooms than one with low colony strength. Previous economic analyses of pollination services markets have assumed honey bee colonies are homogenous, ignoring delivered colony strength as an influence on pollination potential. Many countries are currently focused on promoting honey bee health, so disregarding the relationship between colony strength and pollination fees can have tremendous policy implications through overlooking a key aspect of the value of pollination services to agricultural producers, and understating the full economic impacts of colony health issues on beekeeping operation profits.

In my job market paper I answer the questions: What is the theoretical profit-maximizing solution for handling moral hazard in almond pollination and, in reality, are almond growers using moral hazard-mitigating contract provisions that adjust per-colony fees according to heterogeneity in delivered colony strength? Using data that I collected from almond growers at the 2015 Almond Conference, I find that many almond pollination contracts in 2015 contained minimum colony strength requirements. Additionally, using the California State Beekeeper’s Association pollination fee survey, I find that per-colony almond pollination fees decrease with decreases in delivered colony strength. Both empirical results are consistent with the moral hazard-mitigating contract I outline in a theoretical principal-agent model. This implies that beekeepers who experience high winter mortality rates likely also receive lower per-colony almond pollination fees due to low delivered colony strength; this key relationship is ignored when colonies are treated homogeneously. I estimate that a five percent increase in winter mortality rates leads to a seven to eight percent decrease in total revenues from almond pollination.

Another component of my dissertation will continue to explore the relationship between colony strength and contract provisions discussed in my job market paper by using a more precise dataset. I am currently working with an almond pollination colony strength inspection operation to collect pollination contract information for almond orchards on which the operation performed colony strength inspections. These data will enable me to directly compare contract provisions with corresponding outcomes, a rare ability in the agricultural contract literature. My findings will provide valuable information on beekeepers’ responsiveness to financial incentives in almond pollination.

The final part of my dissertation includes an examination of how almond grower characteristics relate to the use of various contract provisions and types. I find that users of formal, written almond pollination contracts had

on average significantly more experience in almond production, higher yields and more almond acreage than users of oral pollination agreements. These findings are important because little is known regarding almond growers' underlying preferences for different types of pollination agreements.

My past and current research has supplied me with training in applying economic theory and methods in combination with practical knowledge of industry institutions to answer applied economic research questions. From the initial stages of my dissertation research, I have actively engaged with industry participants in the almond pollination market to gather as much practical industry knowledge as possible. My experiences have accentuated the benefits of industry engagement in quality economic research. For example, my extensive interviews led to the discovery that colony strength is a key component of almond pollination contracts that had been overlooked in prior economic research on pollination services markets. Furthermore, the interviews allowed me to overcome data scarcity challenges common to economic studies of pollination markets and agricultural contracts. Networking with the agricultural community presented me with many opportunities for data collection that otherwise would not have existed. I have worked with the Almond Board of California and the California State Beekeeper's Association to construct unique survey datasets, and have been given access to proprietary data from one of the largest third-party colony strength inspection operations in the almond pollination industry. In my pursuit of creating an accurate depiction of the almond pollination industry, I have gained the trust of participants on both sides of almond pollination agreements, and with their help, have overcome one of the biggest obstacles in analyzing pollination services markets.

A principal research goal of mine is to participate in multi-disciplinary projects to provide scientifically-sound economic analyses of agricultural production decisions regarding the efficient and sustainable use of inputs, farming practices and new agricultural technology. I have experience participating in multi-disciplinary projects. I assisted UC Davis Extension Specialist, Karen Klonsky, with research for the Integrated Crop Pollination Project, which seeks to inform agricultural producers of best management practices to provide consistent and economical crop pollination. In addition, I worked with Iowa State University professors Dermot Hayes and Keri Jacobs as a project economist for CenUSA Bioenergy, a program that promotes sustainability in Midwestern cropping systems through the growth of perennial grasses on marginal cropland for advanced biofuels production. Through both of these research projects, I developed experience communicating with and collecting economic data from scientists, and I observed the enormous benefits that arise from collaborating with researchers in other disciplines, such as improvements to research brought by expertise in many fields, and a greater ease of communication and credibility with agricultural producers. I believe working with scientists such as agronomists, plant geneticists, soil scientists, entomologists, among others, is key to providing farmers with the highest quality research to inform their production decisions.

In the future, my objective is to continue my approach of collecting relevant industry knowledge, along with applying economic theory and methods to answer research questions in other agricultural topic areas. I am especially interested in pursuing questions regarding how agricultural policy impacts individual agricultural production decisions at the firm level, and the economic factors influencing the use of contracts between agricultural producers and processors and input providers. For example, I have been particularly interested in the neonicotinoid pesticide policy debate in the U.S. and other countries in recent years. As a critical pest management tool for farmers, I think it would be useful to explore the implications a ban or regulation of neonicotinoid seed treatments or foliar applications would have on farmers. This project ideally should take on a multi-disciplinary approach because it would involve economic decisions regarding the use of alternative, and likely less effective, pesticides. I look forward to improving agricultural producer livelihoods through my research agenda that contributes useful information to agricultural industry participants and policymakers.