

Public Abstract

First Name:Jewelwayne

Middle Name:

Last Name:Cain

Adviser's First Name:Joe

Adviser's Last Name:Parcell

Co-Adviser's First Name:

Co-Adviser's Last Name:

Graduation Term:FS 2015

Department:Agricultural Economics

Degree:PhD

Title:Three Essays on the Economic Value of Innovation and Quality within the Soybean Supply Chain

Population growth and rise in personal income worldwide have led to a high rate of increase in global food demand. Efforts by global agricultural supply to meet this demand, however, is threatened by a decreasing number of agriculture workers across the globe and a slowing expansion of agricultural acreage. Crucial to this effort is agricultural innovation that leads to increases in agricultural productivity. One of the most important global agricultural crops is soybeans. So far, innovations in the seed quality of soybean has enabled farmers to meet growing global food and energy demands—particularly on specific nutrient components such as protein and oil—and to mitigate the effects of several stresses facing soybean plants including droughts. However, the farmer's ability to remain competitive and meet demand through innovation still requires further understanding of several areas, three of which are the focus of this dissertation. These areas, each one contained in one chapter, addresses a specific topic while following a general theme: analyzing the economic value of innovation and quality within the soybean supply chain. The first chapter looks at the evolution of soybean drought-tolerance to consider if the impact of innovation is evenly distributed geographically in three U.S. relative soybean maturity zones—divided areas defined by how long soybean crops mature based on environmental factors. Results show that crops planted in all three relative maturity zones are exhibiting increasing tolerance over time only against droughts occurring between August and October. There is evidence, however, that soybeans planted in relative maturity zone 4 exhibited the largest improvement in drought tolerance, while those planted in relative maturity zone 3 exhibited the least. In the second chapter, the values of two important soybean traits—protein and oil content—are estimated and the demand and supply factors that affect these values are also analyzed. The results show significant positive values, suggesting that there is an incentive for U.S. farmers to produce soybeans with higher quantities of protein and oil content. Finally, the third chapter uses data on four soybean exporters to the Philippines—United States, Canada, China, and the rest of the world—to determine whether the downward trend in the U.S. market share is due to differences in the quality of soybeans or due to changes in relative prices. Results show that the Philippine demand for imported soybeans is less responsive to relative price changes and is more determined by quality differences. This strongly indicates that the decline in the U.S. import market share may be due to shifting of preferences of Philippine consumers toward soybean qualities inherent in non-U.S. soybeans.