In Partial Fulfillment of the Requirements for the Degree of

Master of Art

Booyoung Kim

Will defend his thesis

Analysis of Alfalfa Production in the Water-Stressed US West: Using Dynamic Land-Use Change Model

Abstract

Alfalfa is a major feed crop widely cultivated in the United States. It is the fourth largest crop in acreage in the US after corn, soybean, and all types of wheat. As of 2003, about 48% of alfalfa was produced in the western US states where alfalfa ranks first, second, or third in crop acreage. Considering that the western US is historically water-scarce and alfalfa is a water-intensive crop, it creates a concern about exacerbating the current water crisis in the US west. Furthermore, the recent increased export of alfalfa from the western US states to China and the United Arab Emirates has fueled the debate over the virtual water content embedded in the crop. In this study, I analyzed changes of cropland systems under the three basic scenarios, using a stylized model with a combination of dynamical, hydrological, and economic elements. The three scenarios are 1) international demand for alfalfa continues to grow (or at least to stay high), 2) long-term droughts persist or intensify raising the price of water, and 3) deficit irrigation is widely imposed in the dry region having water scarcity. Through the analysis, I will show the implication of alfalfa production and water supplies on the economy and the environment in the arid western US.

Wednesday, April 15, 2015
2:00 pm
Wrigley Hall 401

Faculty, students, and the general public are invited.

Supervisory Committee:
Dr. Rachata Muneepeerakul, Chair
Dr. Rimjhim Aggarwal, Member
Dr. Benjamin Ruddell, Member