A SPATIAL ANALYSIS OF TECHNOLOGY DIFFUSION IN AGRICULTURE: IMPLICATIONS FOR COTTON PRODUCTION Andrew P. Wright Darren Hudson Maria Mutuc Texas Tech University Lubbock, TX

Abstract

The innovation of new irrigation technology is responsible for increases in irrigated production. As such, understanding who will adopt new irrigation technology, as well as where new technology is most likely to be used, is crucial to understanding how to manage water resources in the future. This paper examines the adoption of center pivot technology with two questions in mind: do producers influence the adoption decisions of their neighbors, and will certain locations adopt a new technology before others? To answer these questions, seven years of center pivot counts for counties in the High Plains Underground Water Conservation District no. 1 was collected, along with county specific information regarding physical factors related to the adoption decision. For each year, a cross-section was created for which a Moran's *I* value was calculated to determine the existence of spatial clustering, and an OLS model was estimated to determine the existence and type of spatial relationships. Based on these results, either a spatial error model (SEM) or a spatial lag model (SAR) model was estimated to determine how strongly spatial relationships affect adoption. Moran's *I* values indicated that positive spatial clustering existed in first three years; however, OLS results showed no evidence of spatial interdependence. The conclusions drawn from these results is that, especially when irrigation technology is first introduced, location is important to determining who adopts; however; it is unlikely that current users of a new technology are influencing non-users to adopt themselves.