VALUING WEATHER INFORMATION IN IRRIGATED AGRICULTURE

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Abstract. Weather information is, and will continue to be, an important input into management the decisions of many human activities. The value of weather information depends critically on its accuracy. In the agricultural sector, accurate weather information can be used to improve decisions regarding planting date and crop choice, as well the timing and rates of pesticide, fertilizer and irrigation applications. Accuracy, however, is a function of the spatial resolution of the information.

Operating and maintaining weather stations to record accurate weather information can be expensive. Recent and projected budgetary cuts in states across the country have the potential to affect the operations of weather information networks designed to assist agricultural and natural resource management. This paper develops a new methodology for estimating the value of weather information networks focusing on the costs incurred when the resolution of the network is diminished.

The fundamental concept underlying our methodology is that farmers develop production strategies based on the actual weather experiences of their own farm. To implement those strategies, however, they rely on data from weather information networks. We combine economic, agronomic, weather, and spatial data to demonstrate the application of the methodology to the GAEMN. Simulation models are used to compare planting dates and irrigation management strategies for corn, cotton, soybeans, and peanuts on several soil types using 30 years of historic weather data. Data generated by the simulation models include yield, input use, costs, and revenues. Optimal management strategies for each crop and soil type are identified for a spectrum of risk aversion attitudes in an expected utility framework.

We estimate that if the Camilla weather station were to go dark, expected net revenues in the study area would fall by $1.1 million per year, and expected water use would increase by more than 3%.