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ECONOMIC IMPACTS FROM WEATHER VARIABILITY IN NEBRASKA

*The University of Nebraska - Lincoln*

Ph.D. 1984

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PREVIEW

ECONOMIC IMPACTS FROM WEATHER  
VARIABILITY IN NEBRASKA

by

Glenn David Schaible

A DISSERTATION

Presented to the Faculty of  
The Graduate College in the University of Nebraska  
In Partial Fulfillment of Requirements  
For the Degree of Doctor of Philosophy

Major: Agricultural Economics

Under the Supervision of Professor Raymond J. Supalla

Lincoln, Nebraska

December, 1984

**TITLE**

Economic Impacts From Weather

Variability In Nebraska

**BY**

Glenn David Schaible

**APPROVED**

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ECONOMIC IMPACTS FROM WEATHER  
VARIABILITY IN NEBRASKA

Glenn David Schaible, Ph.D.

University of Nebraska, 1984

Advisor: Raymond J. Supalla

This study was concerned with the issue of direct economic impacts of abnormal weather conditions on the Nebraska agricultural economy. The study included several objectives: (1) to measure the impact of weather variability on cropping pattern shifts and crop yield impacts; (2) to analyze the effect of changes in cropping patterns and yields on the value of production, selected input expenditures and net farm income; and (3) to analyze the regional sensitivity of weather induced economic impacts, and the sensitivity of such impacts over time, for selected non-average weather events.

Cropping pattern shifts for spring/fall weather events were measured through the use of derived reduced form impact multipliers acquired from a system of crop acreage response functions that incorporated both temperature and precipitation variables. Three-stage least squares was used to estimate the system of acreage response functions for each Crop

Reporting District (CRD). Yield response functions were estimated by crop, by CRD, using an autocorrelated model within the framework of maximum likelihood estimation. For yield functions, precipitation and temperature variables were entered into each equation for the planting season, the reproductive growth stage and the harvest period. Additional variables were included for temperature stress and temperature/precipitation interaction during the reproductive growth stage per crop. For input usage impacts, deterministic or engineering cost relationships and crop budget techniques were used to estimate changes in input costs for energy, fertilizer/chemical usage and short-term interest.

Each of the above components were incorporated into a computerized user-interactive weather event assessment model. This model was designed to operate on an IBM-PC with a minimum of 64K internal memory. Three weather events were evaluated with respect to the magnitude and distributional differences in direct economic impacts. These events included a cold spring, a dry spring and a season-long drought. In addition, the empirical results include analysis of intertemporal changes in impacts, as well as the required price effects needed to offset value of production impacts.

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