THE RELATION OF TEMPERATURE AND PRECIPITATION TO CORN YIELD IN CENTRAL ILLINOIS AND EAST CENTRAL IOWA IN 1981

A Thesis

Presented to the

Department of Geography

Western Illinois University

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

by

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January 1984

ABSTRACT

This study analyzed the relationship of maximum temperature, minimum temperature, and rainfall to corn yield at 30 sites in central Illinois and east central Iowa during the months of June, July, and August in 1981.

Though several studies have been completed on the relationship of weather to corn yield, many lacked detailed yield information, since they used yield values based on county averages. Another major limitation with previous studies was the use of possibly inaccurate climatological data because of the distance between the corn sites and the weather observation sites. This study tried to alleviate both of these limitations, first by using yield data from individual sites, and second by employing an interpretation procedure to provide more accurate climatological assessments.

Weekly, monthly, and seasonal time periods were assessed, incorporating mean maximum and minimum temperature along with total rainfall for each time period. In addition, two three week periods (the fourth week of June through the second week of July and the second week of July through the fourth week of July) were evaluated.

Several forms of yield information were used. The average yield at each site was used along with the yield of a specific variety - EK 7700. Yields were also classified into moderate to high yields and low to moderate yields.

Simple and multiple correlations were employed to assess the relationship of the climatic variables to corn yields.

It was found that the moderate to high yields and low to moderate yields had more of the variation in yield explained by weather than yields

that were not classified into higher and lower yields. Management practices reflected by the high-low yield breakdown, were assumed to be responsible. High to moderate yields of both overall yield and EK 7700 yields responded well to maximum temperature and precipitation, while both low to moderate yields did not. In addition, high yield EK 7700 had a strong positive relationship with precipitation while maximum temperature was more important to average yield.

In comparison of the two three week time periods, the time period of the second week of July through the fourth week of July was found to be more important than the period from the fourth week of June through the second week of July.