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# **Climate Impact on Agricultural Efficiency**

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# Climate Impact on Agricultural Efficiency

Analysis on counties in Nebraska along the 41<sup>st</sup> parallel

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## Introduction:

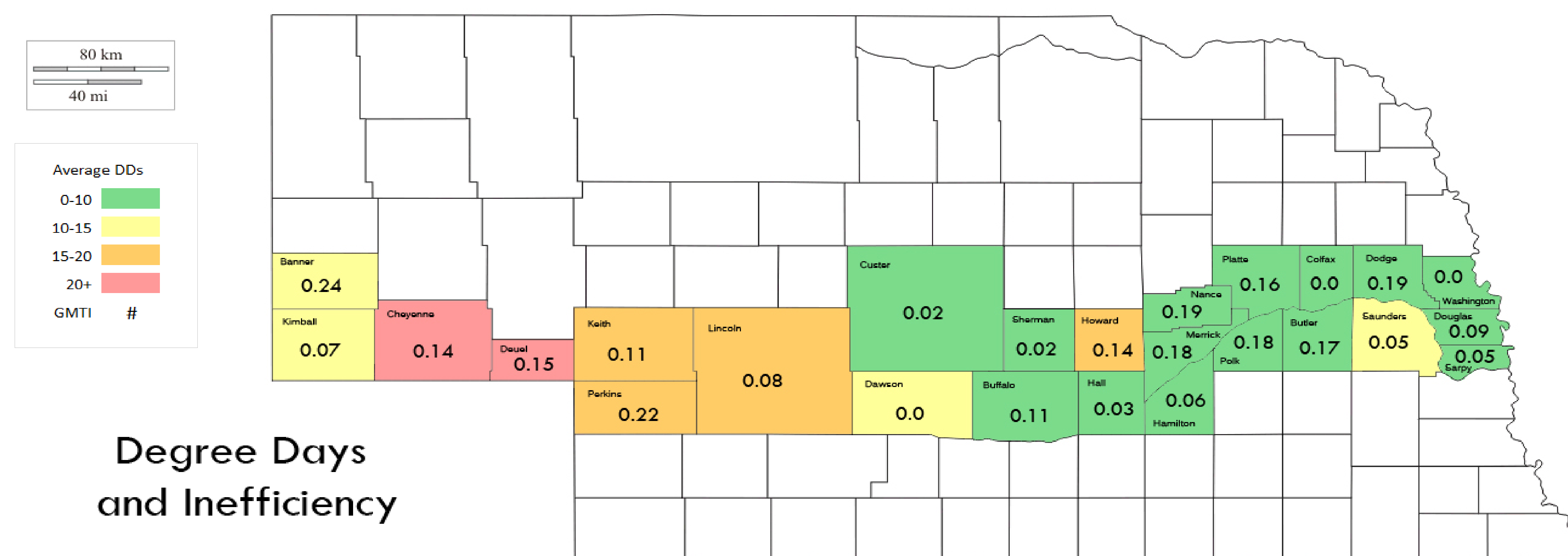
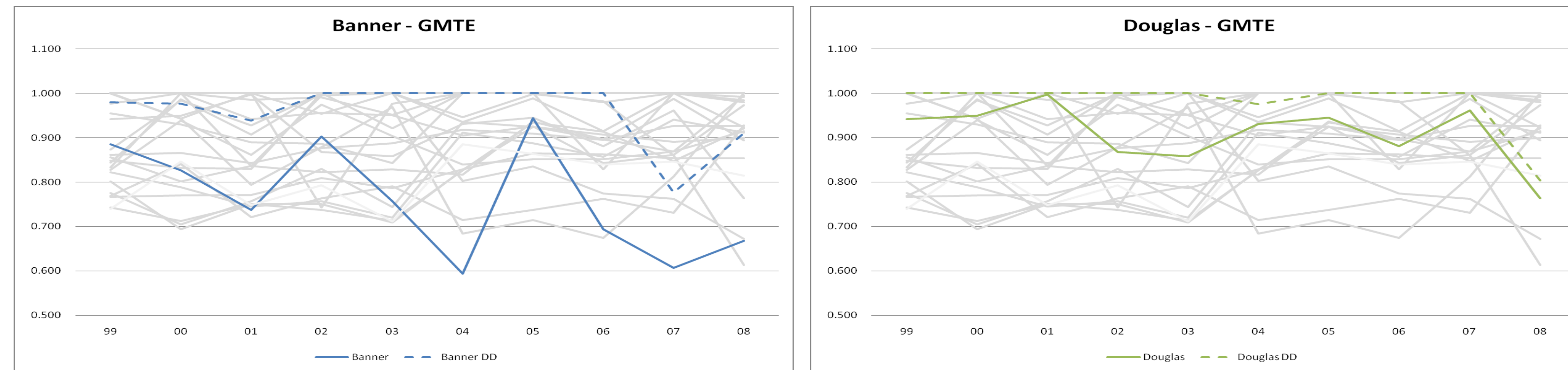
I studied the impact that high temperatures have over the agricultural performance for counties in Nebraska.

## Method:

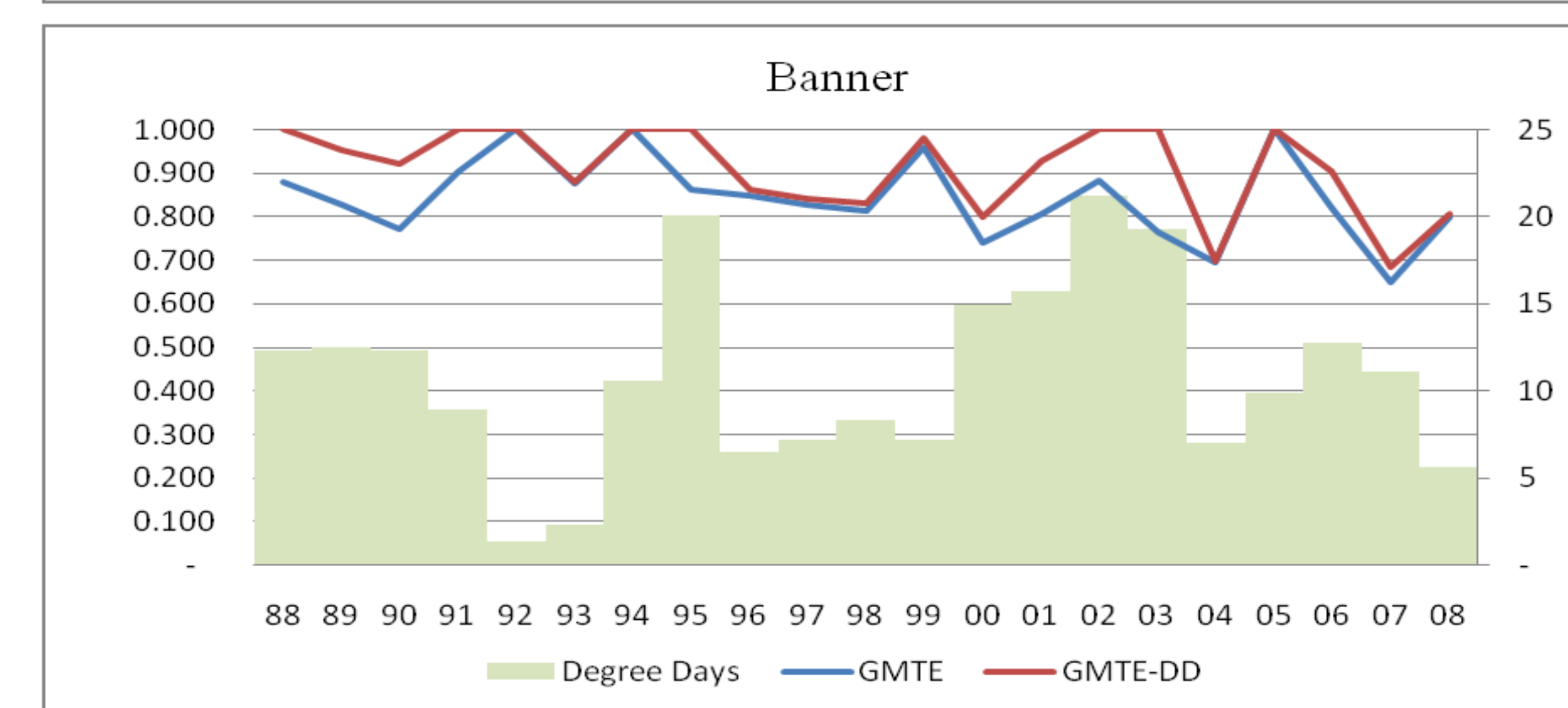
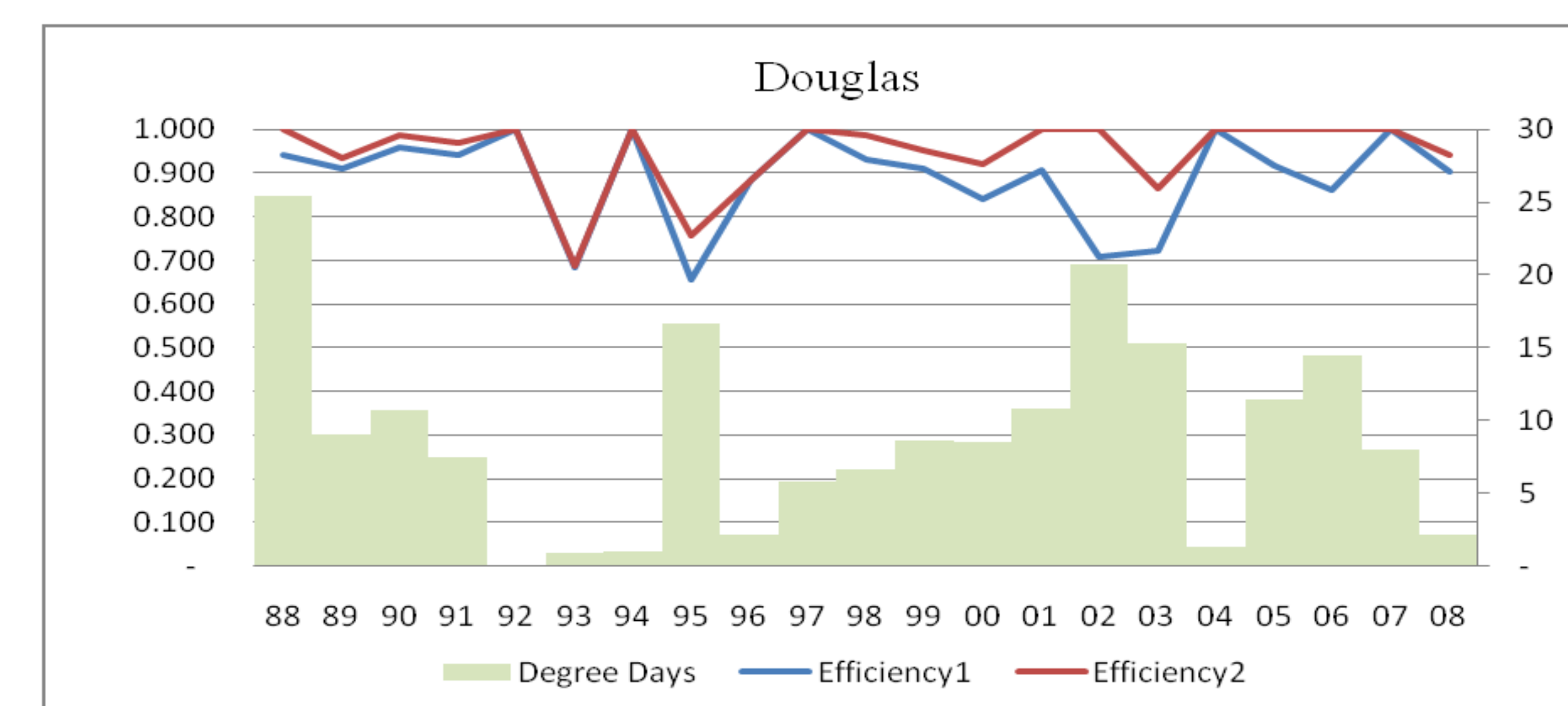
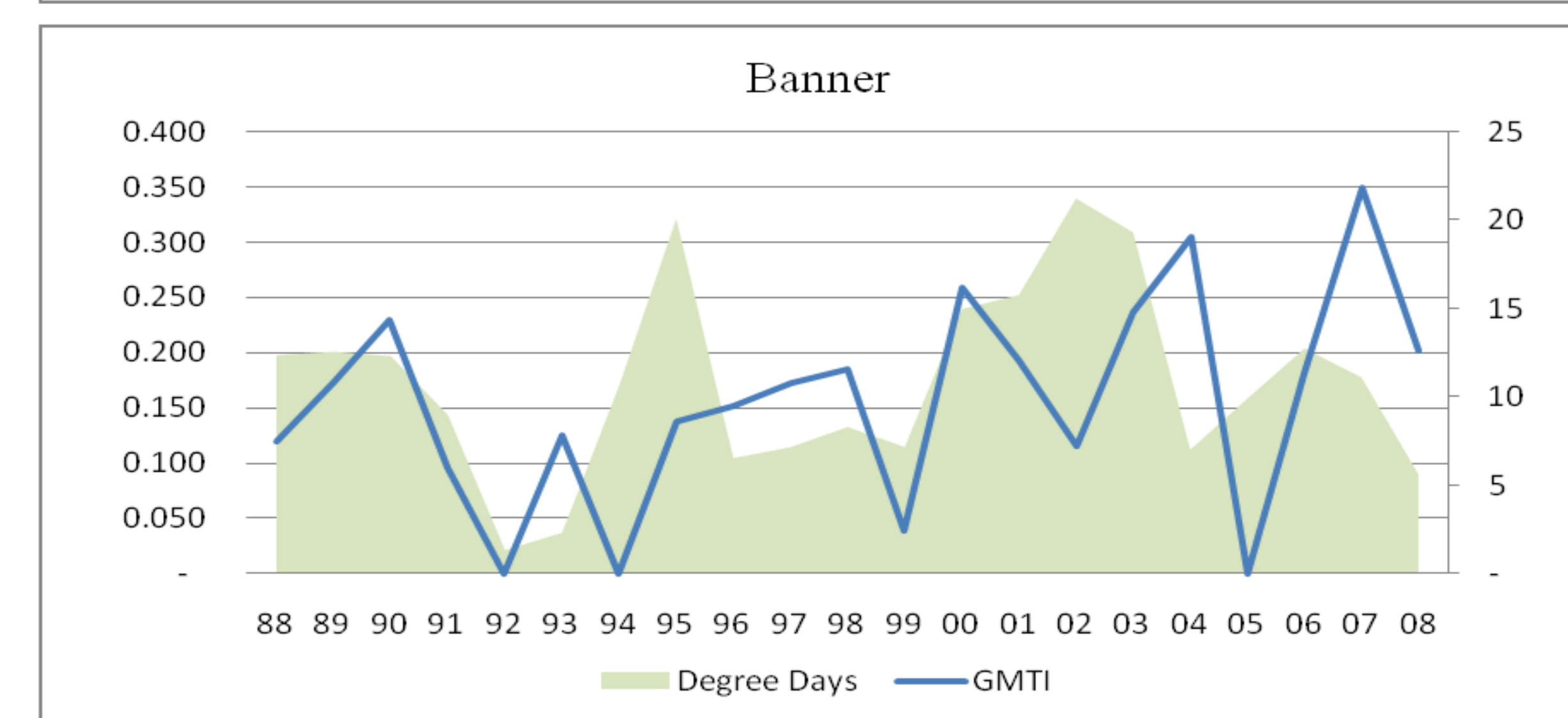
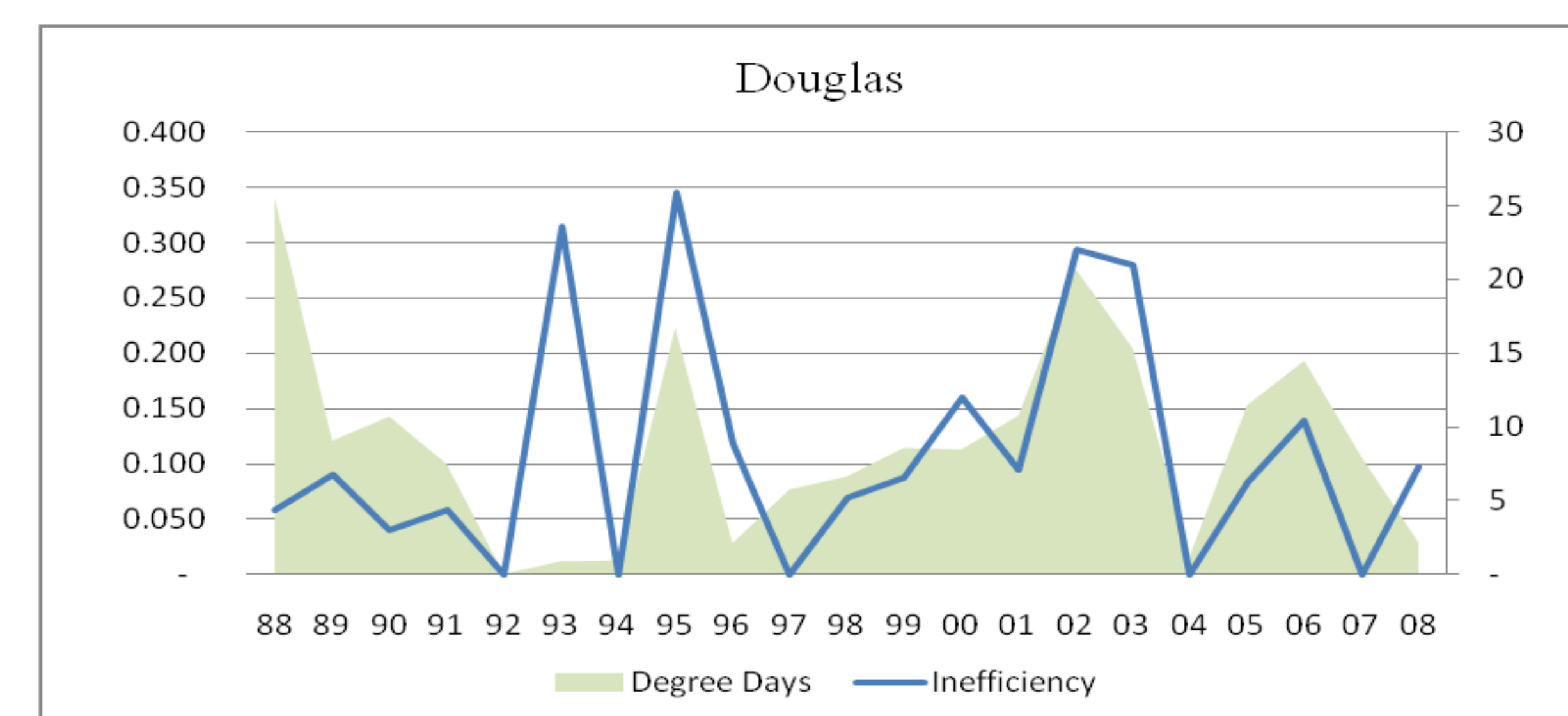
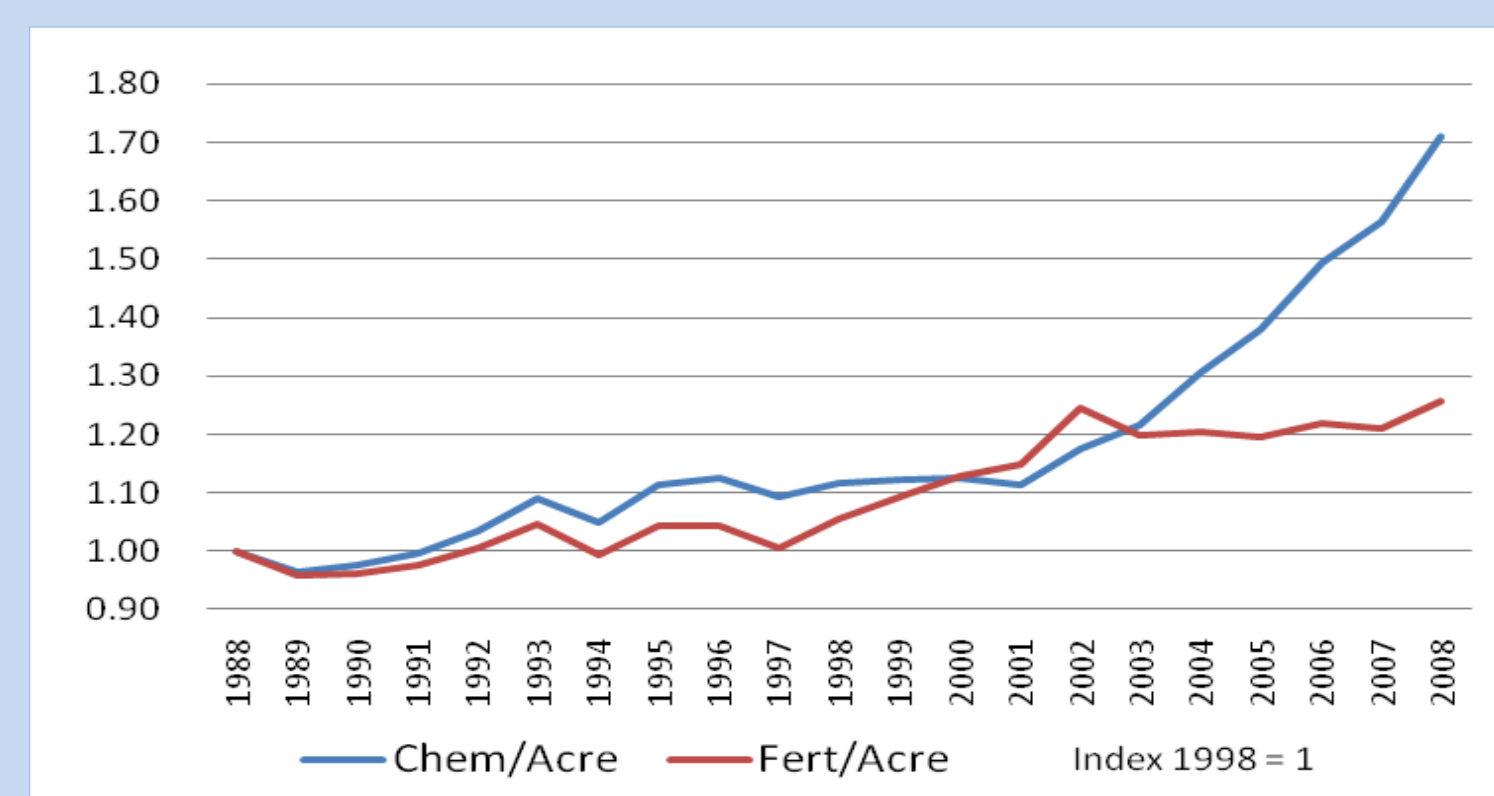
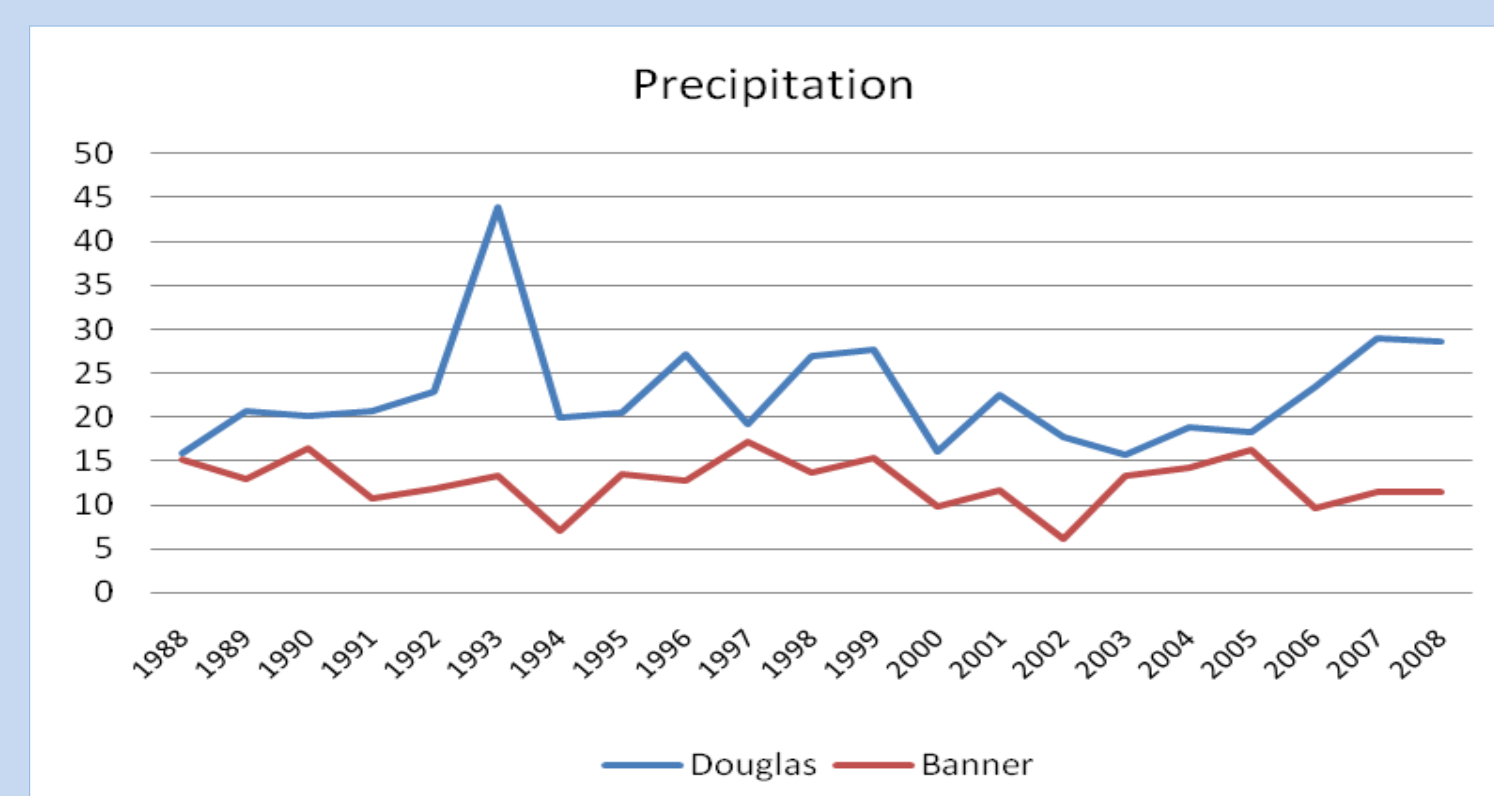
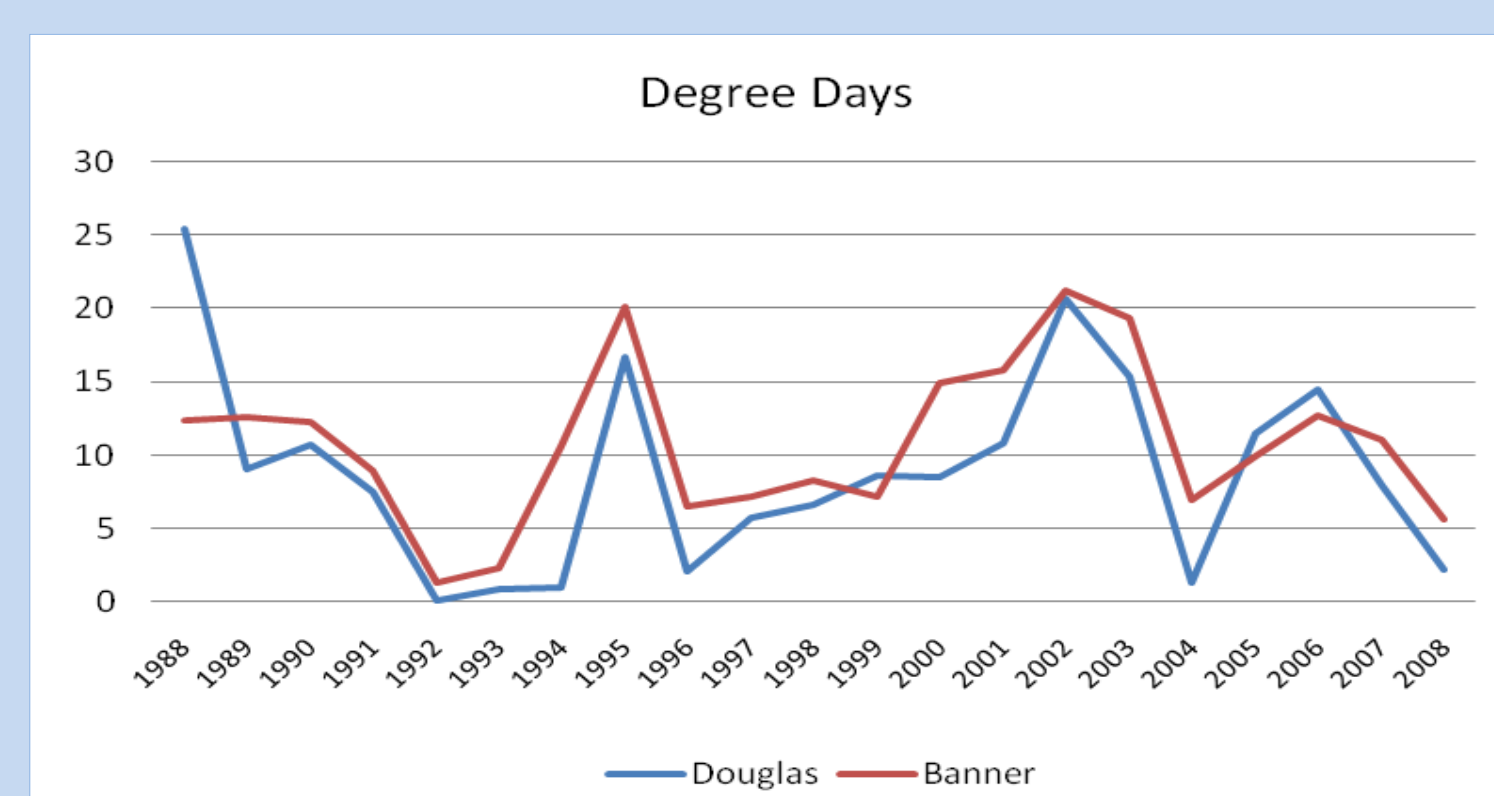
The method of analysis is Data Envelopment Analysis (DEA), which I use to infer the boundaries of a possible feasible technology. I estimate a Graph Measure of Technical Efficiency (GMTE) and Inefficiency (GMTI) for each county in the sample.

*Inputs:* Non Irrigated Area, Irrigated Area, Fertilizers, Chemicals, and weather variables (degree days and precipitations).

*Output:* biomass production.



Degree Days and Inefficiency



## Degree Days:

Temperatures for each county were estimated interpolating the 5 closest weather stations to each county.

A single sine wave method was used to estimate how many hours during each day the temperatures were over 32° Celsius for each county.

One degree day (DD) is defined as one degree above 32° Celsius temperature during 24 hours.

## Results:

For most counties, in most years, increases in the degree days are corresponded with increases in inefficiency.

## Conclusions:

The quantity of days during the growing season where the maximum temperatures were over 32 degrees Celsius (89.2 °F) was found significant to explain decreases in crop yields for most of the counties.

For 14 of the 25 counties analyzed the degree days were found to be very significant to explain inefficiencies on agricultural production.

## Further information:

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