

Using remote sensing to make insurance claim for crop damage due to hail event

Background:

A severe hail event took place on the 25th of June, 2003 on fields located at Hancock, MN. The farmer was growing flax, corn, and soybean on various fields. A good portion of the crops got destroyed by the hail which is clearly visible in the images (Figure 1) taken before and after the hail event. The damage to soybeans was drastic and it reduced the average produce to 9 bushels/acre while the average produce over the field is 27 to 28 bushels/acre under normal conditions.

Use of Data:

Hail insurers make payments on individual field bases. Therefore, all the calculations were performed separately for individual fields.

Landsat images from 15th June (before hail) and 1st July (after hail) were used to perform these calculations. The damaged fields and the extent of damage are evident in the black circles in the image (Figure 1). An NDVI change image was also calculated on pixel by pixel basis between the two images from before and after the event (Figure 2).

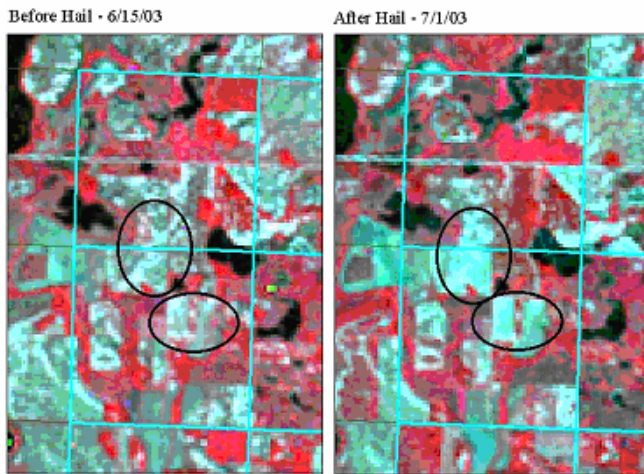


Figure 1. Landsat images acquired before and after the hail event show the extent of hail damage within black circles.

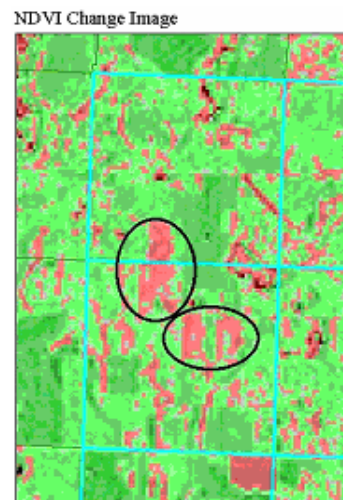


Figure 2. Hail-damaged fields (circled in black) are evident in the change image due to their red color, indicating a decrease in NDVI.

Economic and Environmental Benefits:

The damaged fields are evident in a NDVI change image calculated between the two dates. The accurate delineation of these areas lead directly to insurance payments received for these losses. The insurance payments received were as follows:

Corn- 18% at the rate of \$300/acre
Flax – 28% at the rate of \$150/acre
Soybeans – 62% at the rate of \$200/acre