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# TM VS. MSS DATA FOR CROP AREA ESTIMATION

J.P. ZUTTERMEISTER

Statistical Reporting Service,  
U.S. Department of Agriculture  
Washington, D.C. 20250

## ABSTRACT

The U. S. Department of Agriculture's Statistical Reporting Service (SRS) uses remotely sensed data to improve its estimates of crop areas. This is accomplished through the use of a regression estimator, based on both classified Landsat data and a probability sample of ground data. The use of Multi-Spectral (MSS) data in the regression estimator has been evaluated in a number of SRS studies. This paper investigates the use of Thematic Mapper (TM) data in the crop area regression estimator.

The probability sample of ground data is obtained from interviews with farmers at randomly selected locations. Boundaries of fields corresponding to the interview data are digitized from aerial photographs. After registering the Landsat data--either MSS or TM--to a map base, labeled Landsat pixels corresponding to the digitized ground data are extracted. These labeled pixels are used for supervised training of a maximum likelihood classifier, which is used to classify all the Landsat pixels--labeled and unlabeled--in the area of interest. Crop acreage estimates are then obtained by applying a regression relationship to the resulting full-scene classification results.

Using this approach a 1982 TM scene in Iowa (path 27, row 31) is studied, along with a simultaneously acquired MSS scene. Both MSS and TM-based regression estimates for corn and soybean acreages are calculated. MSS and TM are compared in terms of the variances of the resulting crop-acreage estimates. Several TM sampling designs involving both spatial and spectral sampling are explored.