Residue Cover Assessment Using Landsat Satellite Imagery. (S11-thoma150147-Poster)

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Abstract:

This study tested the accuracy of crop residue cover estimates in current Tillage Transect Surveys (TTS), and the accuracy of predicting crop residue cover from Landsat ETM+ satellite scenes. Ground-reference measurements of residue cover were made in 468 corn plus soybean fields in MN. The TTS estimates were only 45% and 56% correct for soybean and corn fields, respectively. There was a positive relationship between percent soybean residue cover and ETM bands 1, 3 and 7 (r2 =0.67) and between percent corn residue and ETM bands 2, 3 and 7 (r2 = 0.53). For soybean residue cover the relative performance ranking of three previously reported empirical indexes was: NDI (r2 = 0.48), NDTI (r2 = 0.43) and STI (r2 = 0.41). For corn residue cover the relative ranking was: NDTI (r2 = 0.56), STI (r2 = 0.55), NDI (r2 = 0.31). A physically based Crop Residue Index Multiband (CRIM) model under predicted residue cover by about the same magnitude as the empirical models. However, the accuracy of the predictions from the CRIM model increased to 42% and 64% when residue cover was classified into 2 or 3 broad categories, respectively.

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