

Trending Crop Losses for Advancements in Agronomic Technology

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Abstract

A crop indemnity restatement approach is presented in this paper to account for the varying levels in agronomic technology over time. The effects of advancements in agronomic technology on Loss Cost Ratios (LCR) are examined through a regression framework. Historical annual LCR data of both Wheat and Canola from Manitoba over a 20 year period are used in a Cobb-Douglas-type regression model that encompasses both weather and technological trends. Temperature and precipitation data from various weather stations in Manitoba over the same historical period is employed, and spatial homogeneity is assumed for farms within a reasonable proximity of these weather stations. The LCR's are adjusted for average weather levels to emphasize and isolate the effects of technological advancements. Several technologically-related factors are considered: rate of nitrogen use, rate of fertilizer use, percentage of land used to grow superior crop breeds, and the intra-year spread of individual productivity indices. An average technological level is projected for the future period, and is used to restate historical LCR's. Finally, we discuss the risk characteristics of the restated and original LCR's, and relate this to the evolution of the crop risk profile in the absence of adverse weather effects.