

**‘AS-APPLIED’ MODEL VALIDATION FOR VARIABLE-RATE
APPLICATION OF GRANULAR MATERIALS**

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ABSTRACT

Fulton et al. (2001) modeled fixed and variable-rate spread patterns of granular fertilizers and agricultural lime from a spinner spreader by modifying ASAE Standard S341.2 to include a 2-D array of collection pans. This information was then used by Fulton et al. (2000) to develop a method for generating ‘as-applied’ surfaces using GIS functionality to convert a field record of accumulated application volume file into a rate file using the known spread patterns. The purpose of this paper is to validate the ‘as-applied’ model developed by Fulton et al. (2000). A field study was conducted by randomly placing collection pans across a field. Murate of potash was applied to the field using a variable-rate spinner spreader. The location of each pan was marked using DGPS. The material collected in each pan was bagged and weighed. The recorded accumulated application file was then used to generate the ‘as-applied’ surface and predict the amount of material each pan should have received. A 5.5 m offset, a distance inputted by the user to compensate for GPS receiver latency and location, was found to be the appropriate offset to input into the model. A comparison was made between the predicted and actual amount received in each pan with an R^2 of 0.45 calculated. Therefore, the current ‘as-applied’ model did not perform well in predicting the actual material collected in each pan. However, modifications to the current ‘as-applied’ model should improve its performance. ‘As-applied’ surfaces provide a means for evaluating fixed and variable-rate application of granular products by a spinner spreader plus this new methodology enhances researchers ability to compare management approached variable-rate technology.

Keywords: Spinner Disc Spreader, Modeling, Fertilizer and Lime Application, Precision Agriculture