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### “New Methodology Accelerating Extraction, Analysis and Characterization of Enhanced Efficiency Fertilizer Nutrients”

**William L. Hall Jr.** The Mosaic Company, 3095 County Rd 640 West, Mulberry, FL 33860 USA  
Phone: 863-428-7161; Fax: 863-428-7398; Email: Bill.Hall@mosaicco.com

#### Introduction

There are many sources of nutrients in today's marketplace. Application of a new technique to compare sources slow release materials produces a unique nutrient release profile. This profile is generated by accelerating the nutrient release and analyzing the extract by traditional methods. Since nitrogen and phosphate are common causes of water degradation, these nutrients need effective characterization of release facilitating more efficient management. The procedure allows manufacturers and regulators to assess nutrient impacts, make assessments of label claims and product effectiveness. This information, in combination with other techniques, allows correlation with active biological soil systems and can be used to compare the laboratory procedure with actual nutrient release under biologically active growing conditions.

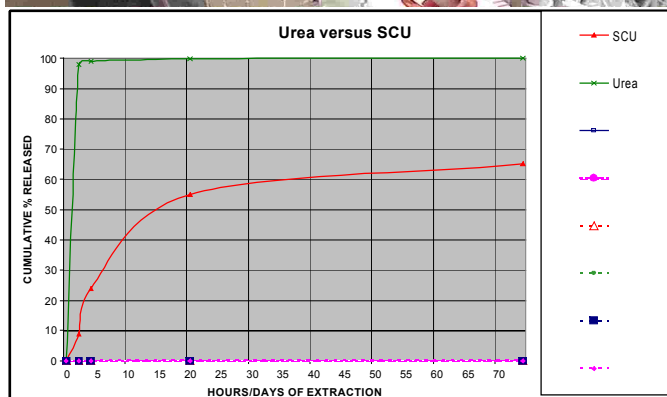
#### Methods and Materials

Jacketed chromatography columns are used to manage temperature during the extraction process. A reversible peristaltic pump is used to move extraction solutions and air through solid fertilizer samples. These extracts are captured and analyzed using traditional analytical techniques for the nutrient of interest (typically nitrogen, phosphate & potassium) a photo of the apparatus is pictured.



#### Results

The results of nutrient analysis of extracts are shown as cumulative percent of total nutrient in the sample. An example of the graphic expression for SCU is pictured.



**Discussion**

To date data have been collected for most slow release materials as well as many organic materials such as biosolids and manures. The release profiles of these materials can be correlated with soil-based biologically active data to validate the method and predict release of test materials and blends of materials.

**Conclusion**

The procedure demonstrates the ability to rapidly extract and characterize nutrient release of many slow release materials currently available for sale and use as Enhance Efficiency Fertilizer products.