System Response of a Variable-Rate Aerial Application System

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Abstract : Variable-rate aerial application systems are becoming more readily available; however, aerial applicators typically only use the systems for constant-rate application of materials, allowing the systems to compensate for upwind and downwind ground speed variations. Much of the resistance to variable-rate aerial application system adoption in the U.S. pertains to applicator's trust in the systems to turn on and off automatically as desired. The objectives of this study were to evaluate a commercially available variable-rate aerial application system under field conditions to demonstrate both the response and accuracy of the system to desired application rate inputs. This study involved planting oats in a 35-acre fallow field during the winter months to establish a uniform green backdrop in early spring. A binary (on/off) prescription application map was generated and a variable-rate aerial application of glyphosate was made to the field. Airborne multispectral imagery taken before and two weeks after the application documented actual field deposition and efficacy of the glyphosate. When compared to the prescription application map, these data provided application system response and accuracy information. The results of this study will be useful for quantifying and documenting the response and accuracy of a commercially available variable-rate aerial application system so that aerial applicators can be more confident in their capabilities and the use of these systems can increase, taking advantage of all that aerial variable-rate technologies have to offer.