

Recommendations for the Development of a Dust Suppressant Test Operations Procedure (TOP) Performed at the U.S. Army Yuma Proving Ground

The goal was to provide recommendations for the development of a Test Operations Procedure (TOP) through implementing test designs and test procedures for evaluating dust suppressant performance and durability. At the time this project was implemented, the U.S. Army lacked a specific TOP designed to provide realistic testing of commercial products sold for dust abatement. Data collected at the Yuma Proving Ground (YPG) were analyzed at DRI and results were reported in 2010. Our analyses supported recommendations and guidelines in support of developing a TOP for testing soil suppressants for military operations. Our study was conducted for one dust suppressant and applies to desert soils, however the methods are applicable to other soil-climate regions and can be used with other products.

Summary of Project Details: We analyzed data collected from tests of a single dust suppressant product that was subjected to six different traffic impact types, at three test sites. We conducted the experiments over a total of 19 weeks and a TOP was developed. The test site locations were chosen to represent a variety of soil texture types and traffic impact types.

Management Implications: Based on our analyses we presented specific recommendations on the following topics:

- Development of test parameters for testing soil suppressants for dust abatement
 - Included TOP criteria for performance and durability, and definitions of those terms
- Use of control plots to evaluate suppressant performance and durability
 - Included disturbed and static baselines, and definitions thereof
- Types of traffic impacts used in evaluating suppressant performance
 - Traffic impact plots and instrumentation showed successful for determining performance and durability
 - Adequate data can be obtained from a single type of vehicle, but may not pertain to rotorcraft
- Instrumentation and methods used in testing performance and durability
 - Soil testing instruments provided excellent data, other instrumentation to measure additional parameters were recommended
 - Crust thickness is not a proxy for surface strength, but is useful in the application metrics of the tested product

