

Regional Local Roads Conference

Rapid City, SD

October 21, 2009

Dust Suppressants: Chemical Additive Usage on Unpaved Roads

Did You Know?

TOTAL PM10 EMISSIONS / YEAR= 33,600,000 METRIC TONS

FUGITIVE DUST ACCOUNTS FOR 88% (29,800,000 METRIC TONS) OF TOTAL EMISSIONS

KEY SOURCES OF FUGITIVE DUST, AS CAUSED BY MAN...

<u>-UNPAVED ROAD DUST</u>	<i>41.3%</i>
-WIND EROSION	17.8%
-CONSTRUCTION	13.4%
-AGRICUTLURE	14.7%
-PAVED ROADS	8.4%

WHILE PM10 EMISSIONS WORLDWIDE ARE ON THE DECLINE, THE VOLUME OF DUST FROM ROAD TRAFFIC IS RISING.

SOURCE: USA EPA National Database Emissions Inventory. Note: Some percentages may have changed due to the way data is now collected.

AZ January 2009



How do you choose the right product?

First, you must define the goal:

- *Dust Control*



First, you must define the goal:

- *Dust Control*

OR

- *Stabilization*



First, you must define the goal:

- *Dust Control*
- *Stabilization*

Second, you must set and agree to expectations:

- *Zero Dust?*
- *90% Reduction?*
- *75% Reduction?*
- *Duration?*



Variables Affecting Performance

1. Climate

- *Temperature*
- *Humidity*



Variables Affecting Performance

1. Climate

- *Temperature*
- *Humidity*
- *Weather*



Variables Affecting Performance

2. Type of Base

- *Aggregate*
 - *Size and Shape*
- *Fines*
 - *Type and Amount*
- *Composition*
 - *Granite, Clay, RAP, Recycled Concrete...*



Variables Affecting Performance

3. Road Preparation

- *Grading*
- *Rolling/Compacting*
- *Pre-wet/Moisture Content*





Variables Affecting Performance

4. Traffic

- *ADT*
- *Type of Vehicles*



Variables Affecting Performance

5. Product Type

- *Chlorides ($MgCl_2$, $CaCl_2$)*
 - *Work on moisture content, keep the road surface wet*



Variables Affecting Performance

5. Product Type

- *Synthetic Polymers*
 - *Latex*
 - *PVA (Polyvinyl Acetate)*
 - *Acrylic Co-Polymers*
 - *Glue particles together.*
 - *Cross-Linking*

Variables Affecting Performance

5. Product Type

- *Oils and Emulsions*
 - *Petroleum or Ag Based*
 - *Coat particles and weigh them down*

Variables Affecting Performance

5. Product Type

- *Lignin*
 - *Organic Binder*
 - *Glue particles together.*
 - *Not Cross-Linking*

Variables Affecting Performance

5. Product Type

- *Proprietary Products*
 - *Can work on different principles*
 - *Evaluate and Compare*

Variables Affecting Performance

6. Product Application Method

- *Top Spray*





Variables Affecting Performance

5. Product Application Method

- *Top Spray*
- *Blade Mixing*



Variables Affecting Performance

5. Product Application Method

- *Top Spray*
- *Blade Mixing*
- *Milling*



Other Considerations

- **Environmental**
 - *Effects on Water*
 - *Effects on Vegetation*



Other Considerations

- **Environmental**
 - *Effects on Water*
 - *Effects on Vegetation*
- **Value**
 - *Price vs Cost*

Product Evaluations

- Lab Data
 - *Moisture Limits*
 - *Compaction Data*
 - *Leeching Data*
 - *Gradation*

Moisture Limit And Optimum Moisture

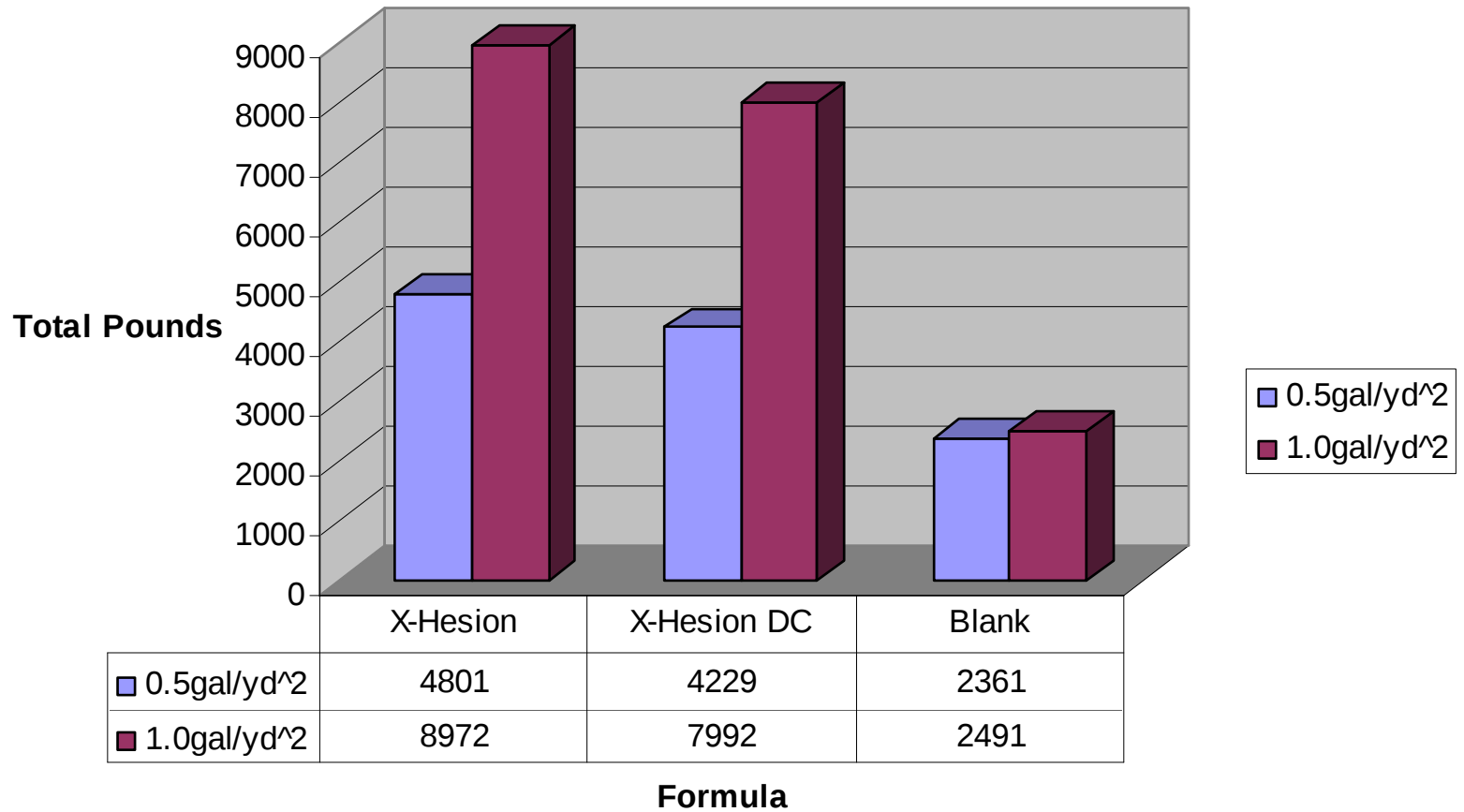
- Critical in deciding application rates and road prep!



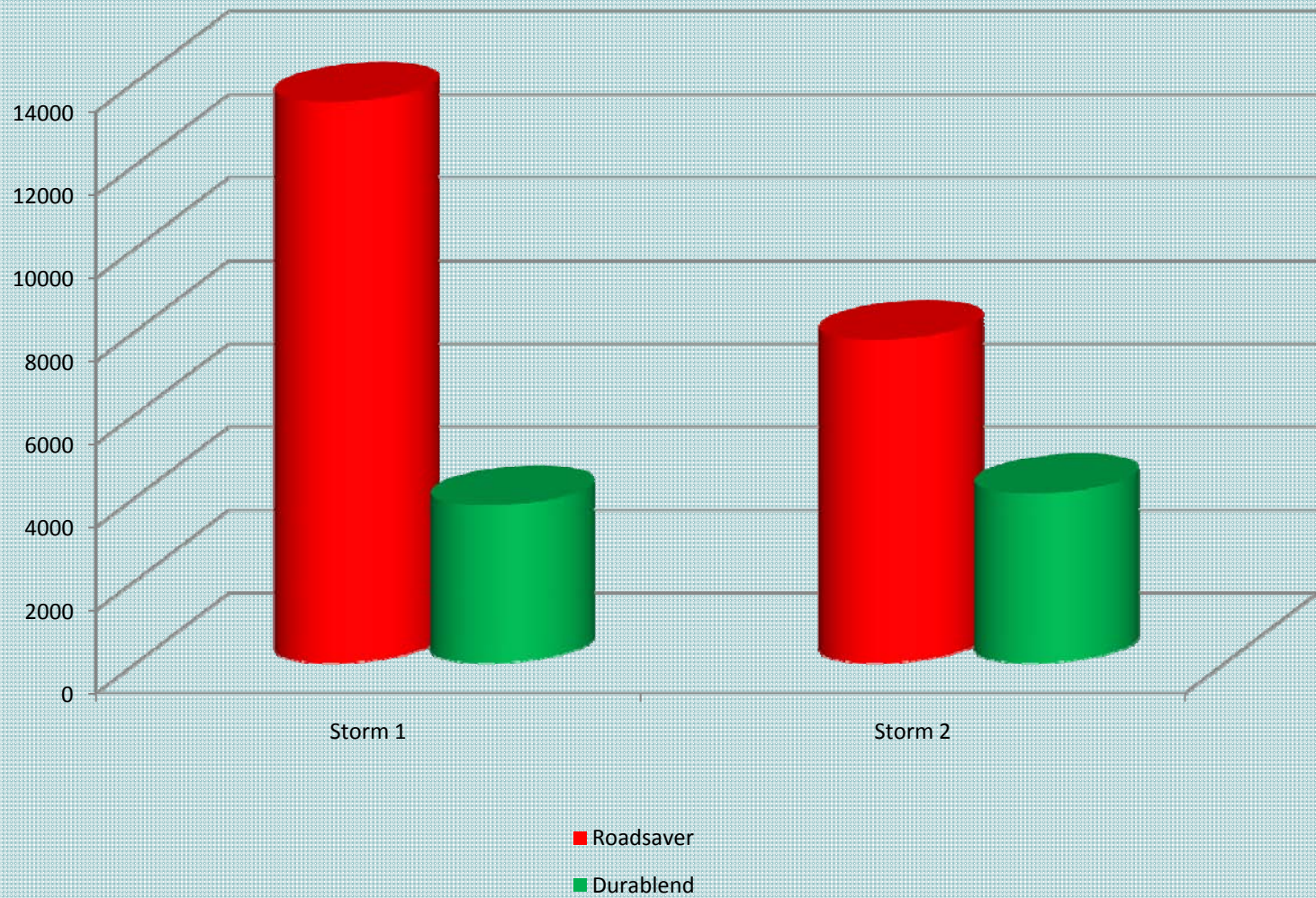


- R Value
- Soil Composition or Sieve analysis
- Plasticity

Compresion



PPM MgCl₂ Lost Through Leeching



Product Evaluations

- Lab Data
 - *Moisture Limits*
 - *Compaction Data*
 - *Leeching Data*
 - *Gradation*
- Field Data
 - *Evaluate and Compare*















Questions?