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The Evolution of Salt Brine



Overview

History of Brine and Brine Making

How we use Brine

Enhancing Brines (Blending)

New Technologies

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OH HOW WE HAVE CHANGED



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AS TIME PASSES ROADS CHANGE

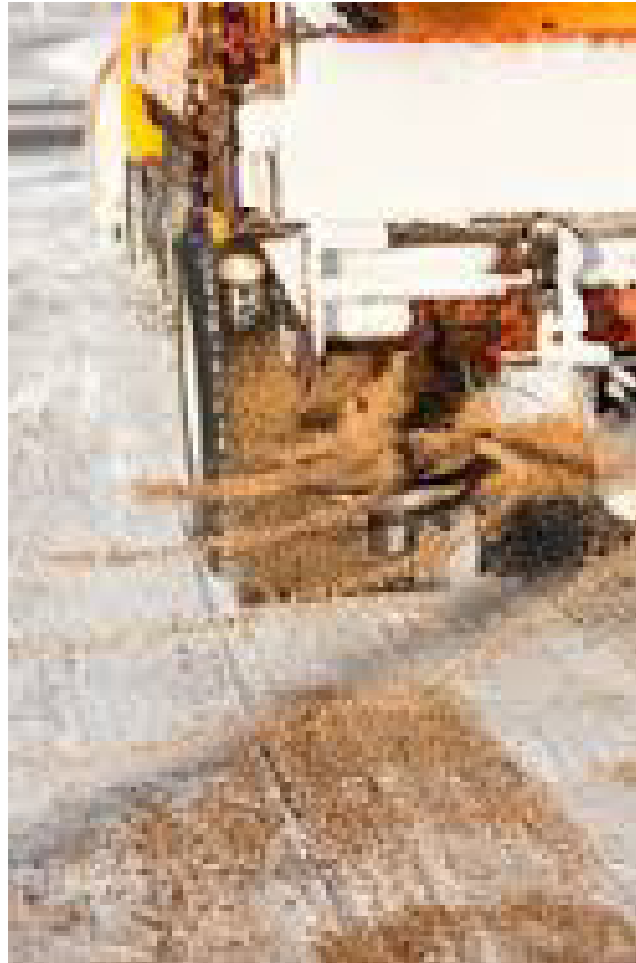


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Pre-Treating Salt (The Hard Way!)





The “Basic” Liquid Is Salt Brine

Easily Made,
Easily Stored,
Easily Handled,
Easily Used

Possibilities with Blending Using
Other Chemicals

The Beginning – Brine Makers



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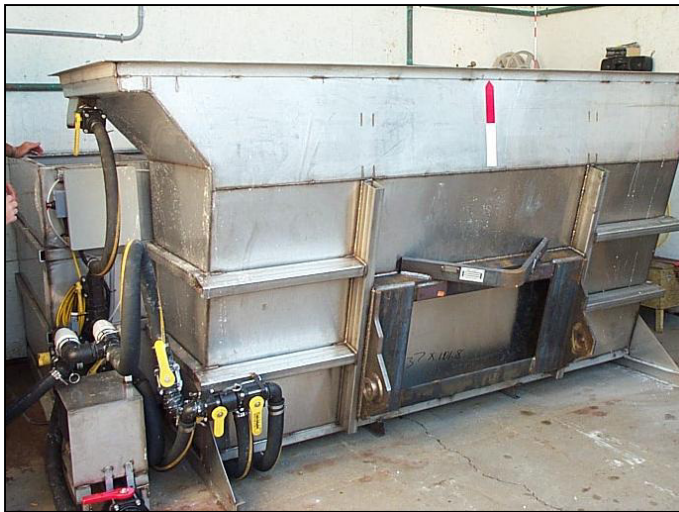


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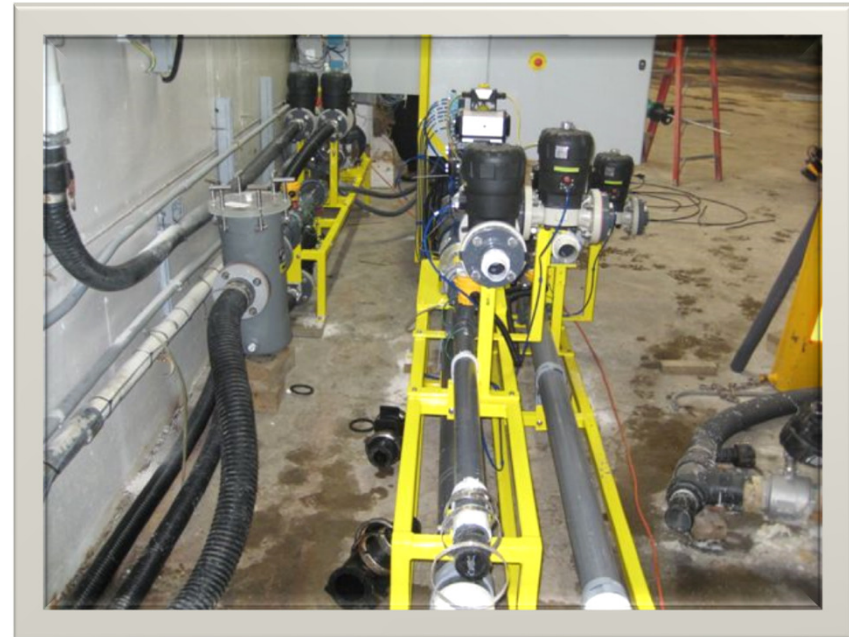


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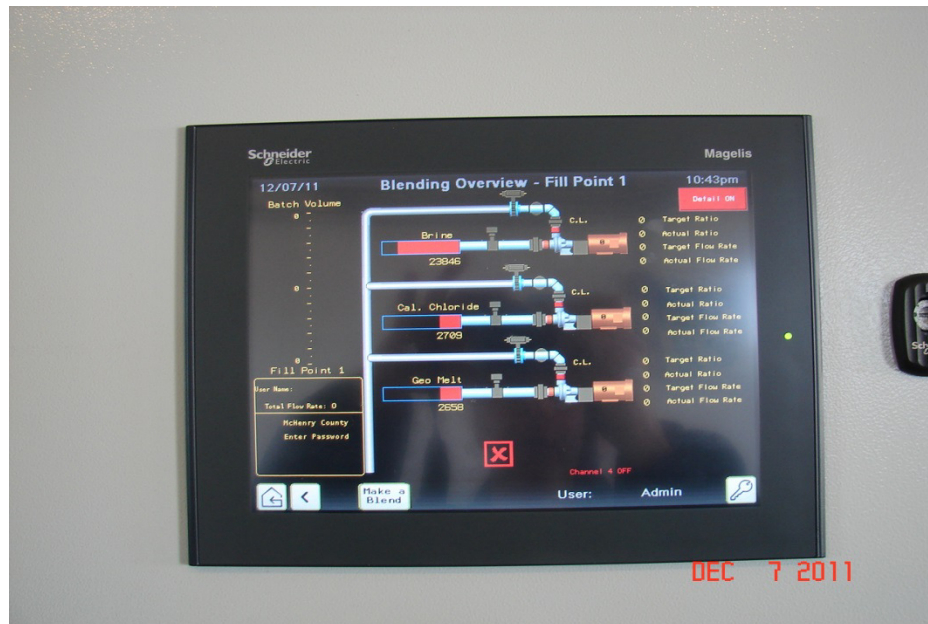
WDM's Newest Brine Maker



“Experimental Unit”



THE SYSTEM CAN ALSO MAKE BLENDS FOR STORAGE IF DESIRED. FILL RATES, RATIOS AND BATCH PROGRESS CAN ALL BE MONITORED



This is the screen that shows the volume in storage, mixing ratios, volume pumped and all the other goodies

THE OPERATOR CONNECTS THE HOSE, ENTERS THEIR TRUCK NUMBER, ENTERS AN AMOUNT AND IT FILLS IT PRECISELY ACCORDING TO THE PRE-DETERMINED FORMULA



Argentina Brine Maker



Traditional Brine Facility



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WASHINGTON STATE FACILITY

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FORT COLLINS FACILITY



BRINE MAKING IS EASY AND COST EFFECTIVE



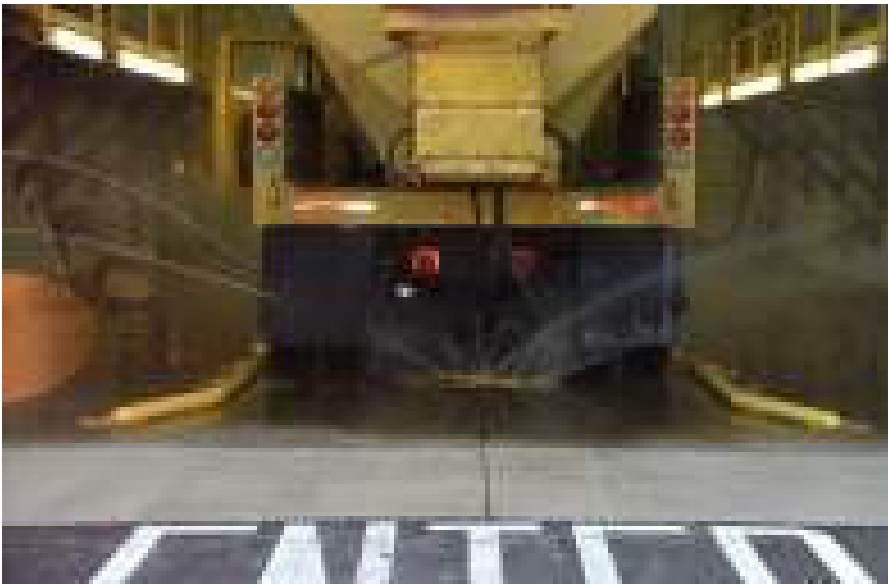
Virginia Brine Water Source



VDOT



Truck Washing Bay - Indiana



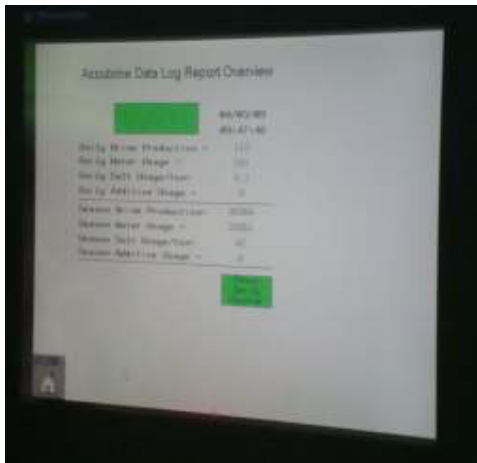
Housed in same building as solid chemical

Indiana DOT - Greensberg

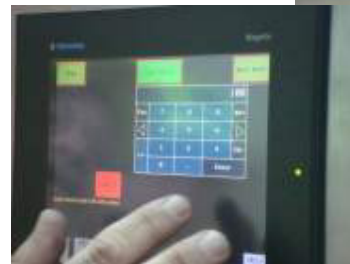


Control Room

All automatically controlled, touch screen actuated, with printouts of production



Accubrine Data Log Printout



Cleaning Out The Mess



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Stainless Steel Brine Maker Fitted With ACS Coupler



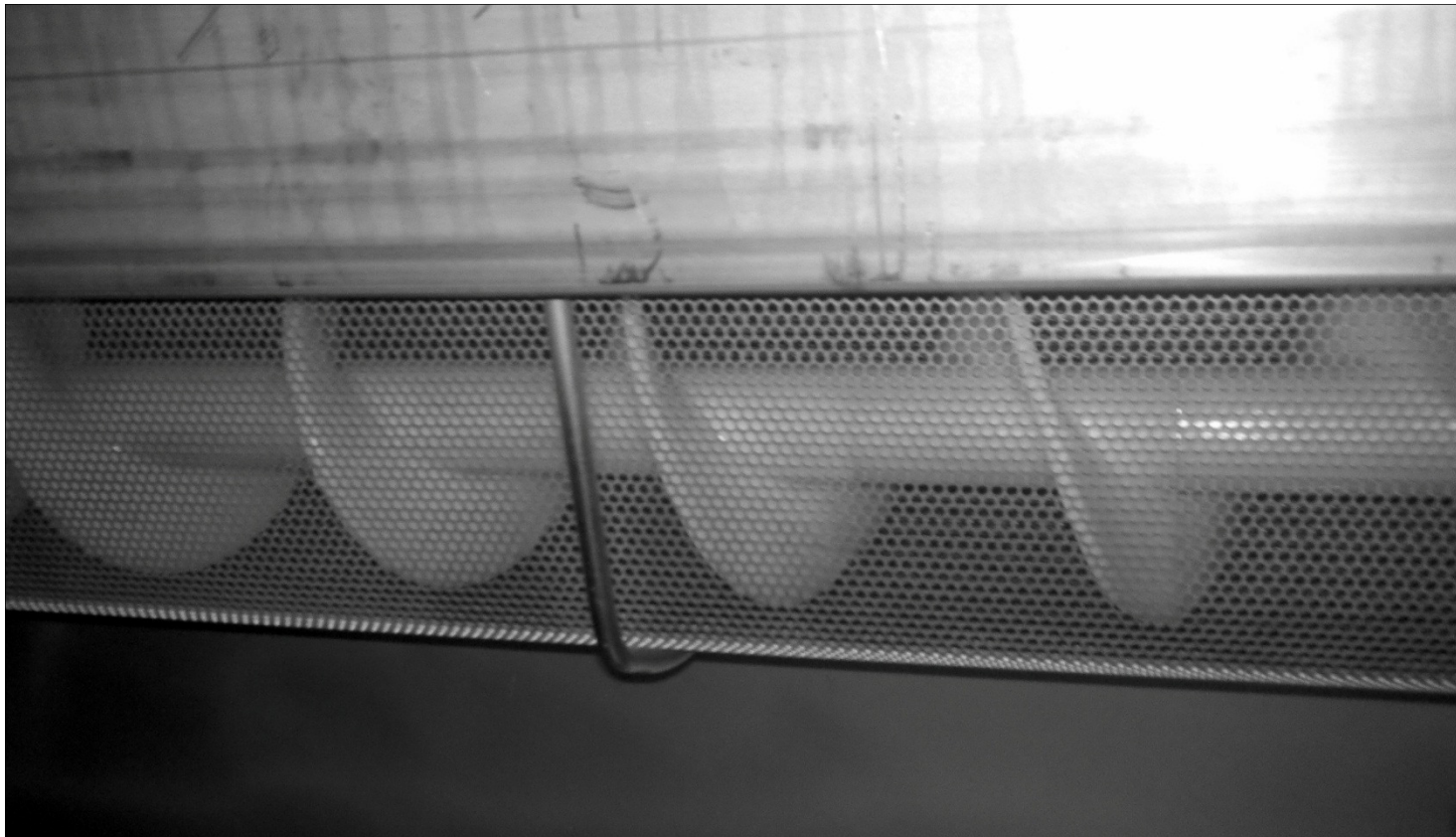


Self Cleaning Designs





Augers out Deposits



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11/05/2016



Application Equipment



Bret's answer to maintaining bike lanes!

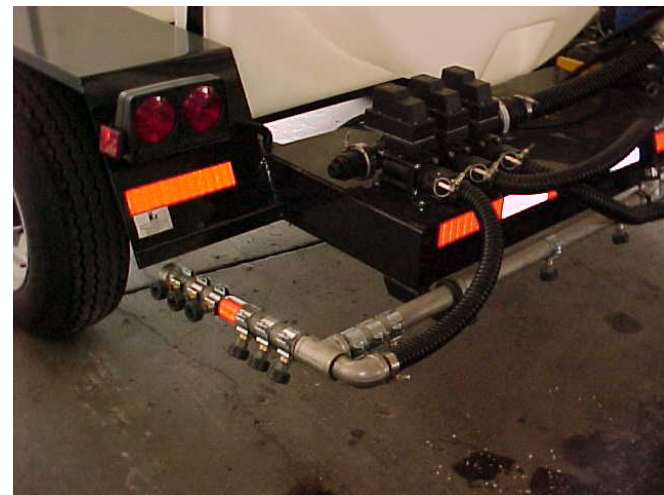


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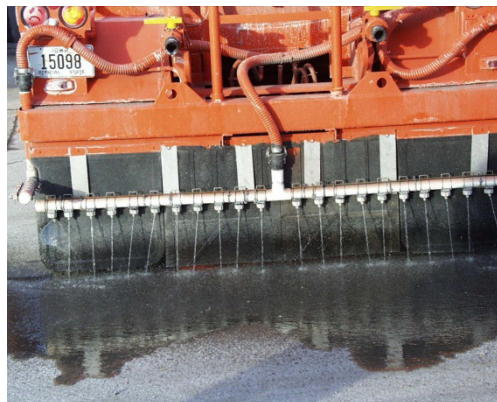


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Flow Boy trailer capable of carrying 2700 gallons of liquid plus 14 tons of dry material



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More Liquid



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How we use brine

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Pre - Wetting

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Slurry Grinder





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Pre-Treating Roadways using Anti-icing

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ANTI-ICING





USING LIQUIDS FOR DE-ICING



**Conditions must be correct for using liquids in deicing.
Warm pavement temperatures, low or no additional snowfall rates,
short route cycle times, no blowing snow.**



Enhancing Brine

Chloride Cocktails

The Art Of Blending Liquid Deicers



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Salt
Brine
85%

Organic
10%

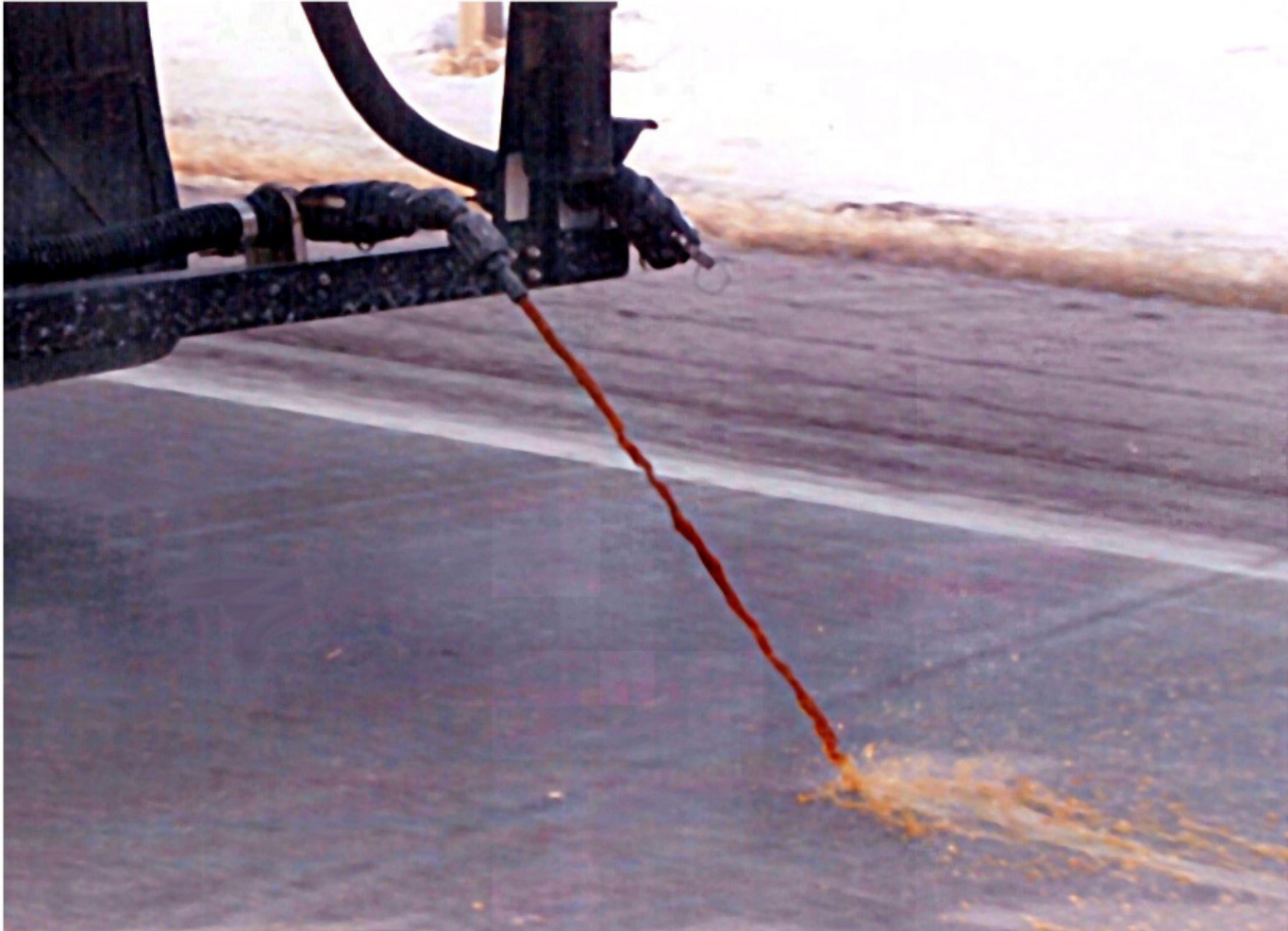
Calcium
Chloride
5%

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MANIFOLD BLENDING SYSTEM



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Mixtures Can Be Purchased



Test Products



Recent Research

Understanding the Effectiveness of Non-Chloride Liquid Agricultural By-Products and Solid Complex Chloride/Mineral Products

Western Transportation Institute

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research for winter highway maintenance

Project 99006/CR13-02
November 2015
Pooled Fund #TPF-5(218)
www.clearroads.org

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research for winter highway maintenance

RESEARCH BRIEF

JANUARY 2016

AG-BASED DEICERS EFFECTIVE AT COLD TEMPERATURES

RESULTS SUMMARY
A literature review, practitioner survey and series of laboratory tests on agriculturally derived and complex chloride mineral deicers evaluated their performance and investigated the molecular processes involved. A best practices manual provides guidelines for material application, storage and handling.

Need for Research
While the functionality of salt as a road deicing agent has been studied extensively, newer agriculturally derived and CCM products have not been as thoroughly evaluated. In particular, there is a need to understand the physical mechanisms behind their effectiveness—what happens on the molecular level to enhance deicing.

Objectives and Methodology
The project included a literature review to identify currently available agricultural-based and CCM products, existing methods for evaluating deicer performance and studies of mechanisms by which deicers and anti-icers function. Researchers also surveyed winter maintenance practitioners about their experience with agriculturally derived deicers and CCMs.

PROJECT DETAILS
Project Title: Understanding the Effectiveness of Non-Chloride Liquid Agricultural By-Products and Solid Complex Chloride/Mineral Products Used in Snow and Ice Control Operations
Project Number: CR13-02
Project Cost: \$191,238
Report Date: September 2015

Project Champion: Ron Wright
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Investigator: Laura Fay
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CONTINUED

Mark – “Always the Innovator”



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THANK YOU!

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