

From The Publishers

Fluid formulations require following select chemical principles.

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As we move through the 2014 growing season, many of your customers will want custom-manufactured fluid fertilizer blends to meet their crop and soil test needs. They will expect water-clear high quality products. To produce these formulations to meet your customer's needs with their total satisfaction, it is important to follow select chemical principles. A fluid fertilizer with some insolubles may be agronomically suitable and functional, but not from a customer's perception. Let's review a few basic principles that will make your product stand out in the marketplace.

Water quality. Water is the matrix/building block for fluid fertilizer manufacturing. We know that water containing high concentrations of salt can reduce fertilizer solubility. Also, high pH can undermine the stability of secondary and micronutrients. So, make sure you use low salt, slightly acidic (pH 6.0 to 6.5) water for fluid manufacturing.

Fertilizer solubility. The solubility of a fertilizer is defined as the maximal amount of a fertilizer that can be completely dissolved in a given amount of distilled water at a given temperature. Some formulators add too much fertilizer in an attempt to increase the fertilizer grade of the solution. The result is undissolved solid fertilizer salt in your fluid fertilizer.

Common ion effect. Solubility is also dependent on other fertilizers in solution. If a common ion exists, the solubility of both fertilizers is reduced. For example, potassium nitrate and potassium sulfate are compatible and can be dissolved in the same solution. However, since both contain potassium, their solubility is reduced when mixed together.

Fertilizer compatibility. To produce water-clear fluid fertilizers, we must blend fertilizer salts that can coexist in solution. Otherwise, a precipitation will occur. For example, do not mix sulfur or phosphate sources with soluble



calcium salts. Gypsum (calcium sulfate) or dicalcium phosphate will form and precipitate.

Addition/mixing. The order of addition/mixing in fluid fertilizer formulation management to follow is:

- Always fill mixing container with 50 to 75 percent of the required water if mixing dry soluble sources
- Always add fluid fertilizer materials to the water before adding dry soluble materials. The additional fluid will provide some heat in case the materials are endothermic (cold). Remember, temperature influences solubility
- Always put acid into water and not water into acid.

- To prevent precipitation, always add acid followed by hydroxides/carbonates and then neutral products to the water
- Always add dry ingredients slowly with circulation or agitation to prevent the formation of large insoluble or slowly soluble lumps
- Do not mix aqua ammonia directly with any kind of acid. The reaction is violent and immediate.

Please follow these suggestions to optimize product quality and safety. We wish you great success.

Dr. Easterwood is Director, Agronomic Services at Yara North America, Inc. in Tampa, Florida.

23rd Annual Fluid Forum Gathers At New Location

Capacity crowd assembles at Talking Stick Resort to hear leading researchers.

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New on the scene of the 23rd Annual Fluid Forum held in Scottsdale, Arizona, were the sparkling facilities of Talking Stick, a casino resort that first opened in 2010 and offers ample meeting, dining amenities and entertainment. The meeting drew leading researchers and industry people from both the United States and overseas. It also offered an opportunity for both the Fluid Fertilizer Foundation's (FFF) Board of Directors to meet and decide on business matters, as well as its Research and Education Committee, the research arm of the fluid fertilizer industry, to meet and decide on the funding of new research projects important to





the agricultural community.

The Monday afternoon opening session began with a captivating presentation on a return visit by Steve Siemens of Des Moines, Iowa, on the subject of “Leading Your Customers Into The Future.” He spoke about such things as the individual committing to group goals, how the individual fits into the overall business, what is everyone’s role on a team. He spoke about enthusiasm, entertaining new ideas, a sense of humor, hitching your wagon to a star. He ended on focus as the key: focusing on your competition, small things, listening, and most of all opportunities. Again, Siemens’ energy and charm drew a vigorous applause.

Heading the list of distinguished researchers who followed was Raj Khosla of Colorado State University who spoke on precision water, nitrogen and seed management for enhancing efficiency, productivity and profitability of irrigated cropping systems.

The opening day afternoon session ended with an in-depth evaluation of late-season applications of foliar



nitrogen’s impact on grain yield and milling qualities by Dr. Brian Arnall of Oklahoma State University.

The first day concluded with a Board-sponsored reception in the Fire Garden Atrium as the crowd of 170 registrants were treated to a broad array of gourmet delights.

The second day session attendees listened intently as a broad range of the very latest in fluid technology was covered by 13 speakers on such topics as Micro-scale Changes in P Chemistry, Improving Cotton Production, and Advance Production Systems for Florida Citrus. Of particular interest was the introduction of a Fertilizer Handbook translated into Spanish to be used in Argentina and all of Latin America. According to Ricardo Melgar, it will be downloaded for use on the websites.

At the Tuesday noon Annual Meeting a multi-course luncheon was enjoyed, followed by FFF business and board reports. Recognition was also given to those industry members recognized for their service to the FFF and the fluid fertilizer industry and agriculture as a whole.

Researcher of the Year Award went to Jeff Vetsch of the University of Minnesota for his outstanding contributions to the fluid fertilizer industry.



The prestigious Werner Nelson Award was presented to Dr. Fred Below of the University of Illinois for his outstanding contributions to the fluid fertilizer industry.

Fluid Fellow Awards, given in recognition of leadership in the fluid fertilizer industry, were presented to R. Hovey (Hov) Tinsman III of Twin States, Curt Harbach of HarBrand, Inc., and Dr. Bill Easterwood of Yara North America, Inc. At the close of the meeting, the gavel was passed from Board Chair John Guglielmi of Ostara Nutrient Recovery Technologies, Inc.

“Latest in Fluid Technology Covered.”

to Steve Keller of Morral Company, LLC.

The Tuesday afternoon sessions began with a prophetic look at Leading American Agriculture Into the Future by Charlie Stenholm of Texas, followed by an array of research updates that covered a broad array of the very latest in fluid fertilizer technology.

In 2015, the 24th Annual Fluid forum will again be held at Talking Stick Resort in Scottsdale, Arizona. Dates are February 16 to 18. Be sure to put this on your calendar.

