Sample Prep Water Soluble Fertilizers

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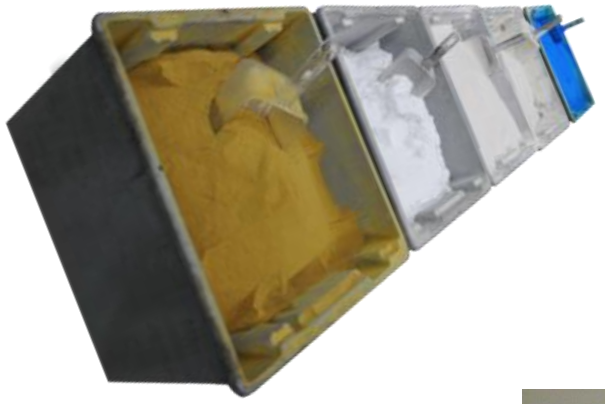
AAPFCO Winter Meeting

Lab Services

Sampling Techniques and Small Sample Sizes can be an issue with Water Soluble Fertilizers that are made with Hygroscopic Components

- Results can be skewed which create violations, fines, and stop sales for fertilizers which do not meet their guarantee
- The total of the nutrients tested do not always show a balancing over and under
- Calcium and Magnesium levels are not always tested
- Larger Sampling Sizes and a different technique (scooping) works



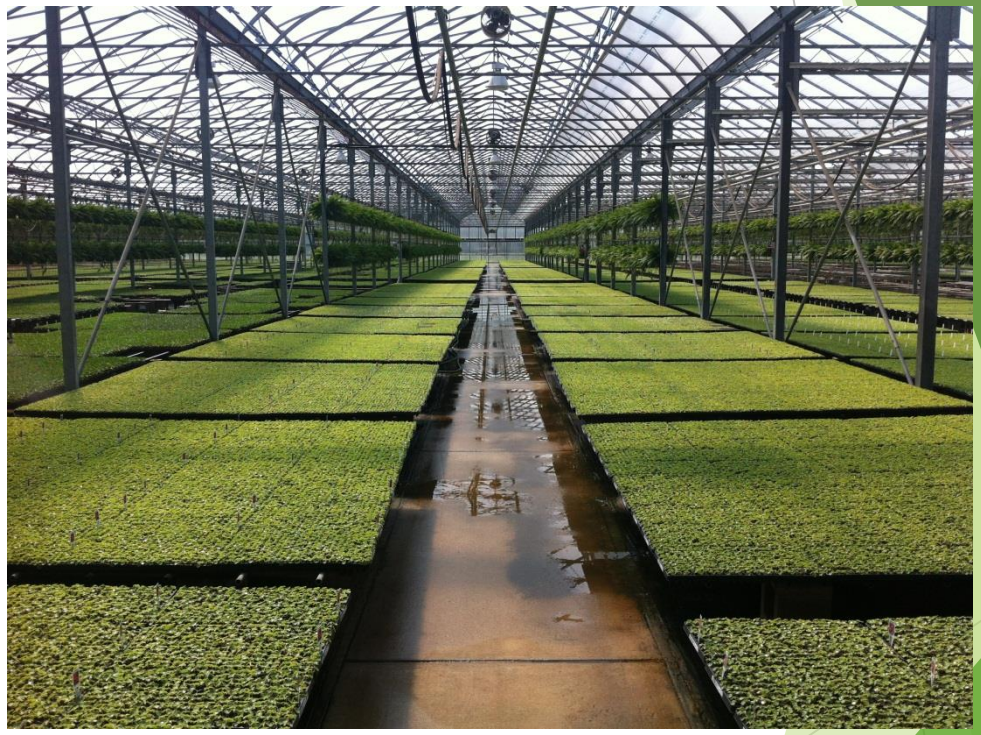
Acid	Tank A *5-12-26*	Tank B *Calcium Nitrate*

Concentrate tanks 20- 50 gallons
2-3 lb. dissolved per gallon
Injector ratio 1:100 – 1:200

JR PETERS INC

Jack's LX 13-2-13

- Designed for plug production
- Over 93% nitrate nitrogen
- Ideal ratio of 6% calcium : 3% magnesium
- Strong cell wall improves post harvest performance
- Low P content to promote compact, sturdy plugs



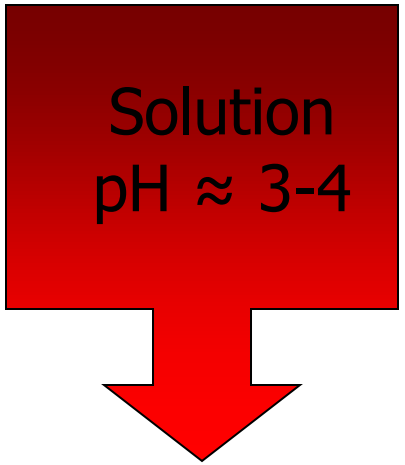
Jack's LX 13-2-13

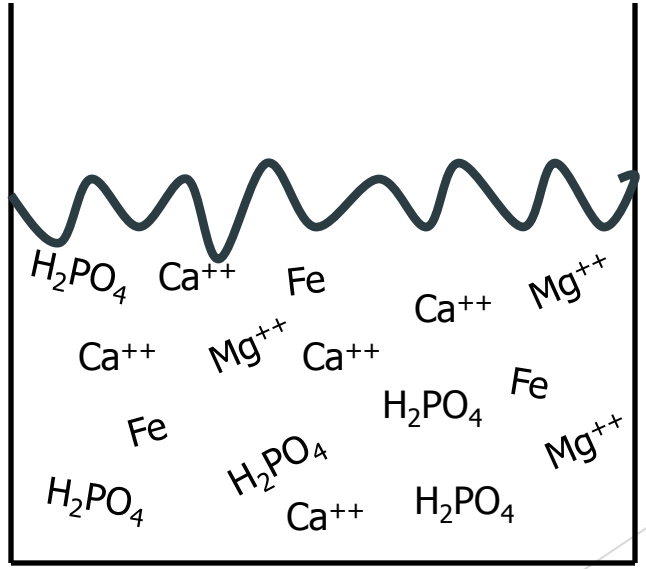
- Key to success = high NO3 and Ca content yet still can be tank mixed with K-Trate for a strong finish
- Reduces need to alternate with a different formula later in crop growth cycle

Jack's LX Fertilizers

Keeping Calcium & Magnesium in Solution

At low solution pH all nutrients can be mixed in one concentration tank without forming precipitates!





13-2-13 Plug LX Autopsy

Calcium Nitrate

Magnesium Nitrate

Ammonium Nitrate

MonoPotassium Phosphate

Potassium Nitrate

Trace Elements

Raw Materials

Various SGN’s and shapes

Very Hygroscopic

Cannot Grind

Difficult to Sample in small quantities

- **J.R. Peters, Inc. - Water Soluble Fertilizer QA Method**
- **SOP#: JRP- 09**
- **Method Name: qafert**
- **Fertilizer Type: Professional Water Soluble Samples**
- **Scope**:
- This procedure is for the preparation and analysis of samples of water-soluble professional fertilizer formulations. These water-soluble fertilizer (WSF) samples are designated by the internal lab login name of **qafert**. Samples will be analyzed on the ICP-AES Spectrometer for: P2O5%, K2O%, Ca%, Mg%, S%, Mn%, Mo%, B%, Fe%, Cu%, Zn%, Al%, and Na%, Sample will also be analyzed on the Skalar automated wet chemistry analyzer for: NO3-N%, NH4-N%, Urea-N%, and Cl%.
- **Apparatus**:
- Analytical Balance
- Volumetric Flasks
- Stir Plate and Magnetic Stir Bar

Batch Sample Procedure:

1. For large batch samples weigh a 250g sub-sample and place into a 1000ml volumetric flask.
2. Fill the flask 2/3 full with DI water.
3. Place mixture on stir plate. Insert stir bar and stir until visibly dissolved. Since this is an endothermic reaction, allow the sample to sit at room temperature for at least 15hrs to ensure total sample dissolution and equilibration.
4. Remove the stir bar and bring up to volume with D.I. water. Mix thoroughly.
5. The resulting solution is a 25% fertilizer solution.
6. Make the necessary dilutions from this solution for the Skalar and ICP. (e.g. For a 1% solution use 20mls of the 25% solution in a 500ml flask. Bring to volume with DI water.)
7. Solution is analyzed using a 0.1% and 0.01% dilution for Skalar and in duplicate on ICP at 0.1% and 1% dilution as well as 0.01% dilution for high P or K containing samples.

What can be done to modify the accepted procedure for sampling and testing these types of products to improve the results?

- Increase the number of core samples taken?
- Increase the size of the sample tested?
- Test present method versus modified method?
- Other suggestions