Loveland PRODUCTS

The Basics of

N-PHURIC®

ONE CHOICE. MANY SOLUTIONS.™

Richard DeSousa • Proprietary Products Manager

What is n-pHuric?

- Urea Sulfuric Acid (urea sulfate)
- Reacted in patented process that results in a higher analysis and a more stable product.
- **15/49** is a 1:1 ratio of urea to sulfuric acid.

  (**15-0-0-16S, 49%** sulfuric acid)
- 10/55 and 28/27 are other formulas.

Handling N-pHuric

- Concentrated N-pHuric is non-corrosive to human flesh.
- Eye-protection is a must.
- Avoid mist inhalation.
- Non-flammable.
- Non-volatile.

Storing and handling n-phuric

- Polyethylene, polypropylene and 316L Stainless are approved materials for storage and concentrated application.

May Be Used:	Do Not Use:
Ceramic	Aluminum
E.P.D.M	Brass
Kynar	Buna-N
Polyethylene	Cast Iron
Polypropylene	Celcon
P.V.C and C.P.V.C	Delrin
Rayton	Epoxy
316L Stainless Steel	Fiberglass
Teflon	Galvanized Steel
Viton	Hypalon
Zalak	Mild Steel
	Natural Rubber
	Neoprene
	Nylon
	Polyester FRP

Treating Irrigation Water

Sulfuric acid reaction with bicarbonate in water:

$$H_2SO_4 + 2HCO_3^- \rightarrow SO_4^{2-}\ 2CO_2 + 2H_2O$$

This makes carbonate and bicarbonate un-reactive with Ca, so it will not cause scale buildup in micro-irrigation and will not cause additional liming of the soil.

Prevents PO_4 fertilizer from reacting with Ca.

Treating water

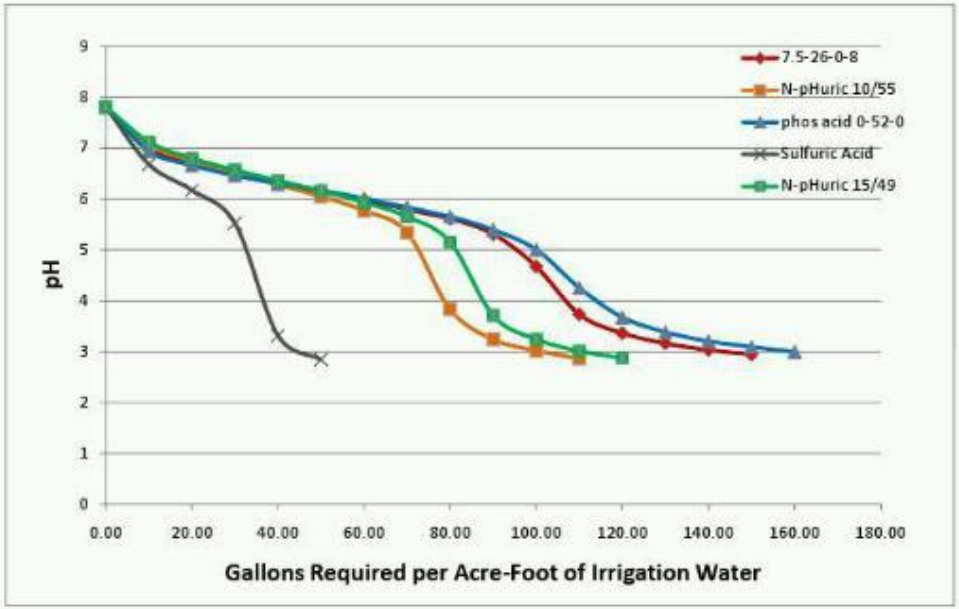
Irrigation Water Buffer Curve

Precision Agri-Lab
24730 Avenue 13
Madera, CA 93637
Phone: (559)661-6386
FAX: (559)661-6135

Log In #: 305264
Grower: BRANCH
Description: Colorado River Water

Branch Name: SOUTHWEST DIVISION
Fieldman: SETH SHERRY
Date Sampled: 4/5/2010

Initial pH: 7.81
Initial Ecw (dS/m): 1.64



	7.5-26-0-8		*N-pHuric 10/55*		*phos acid 0-52-0*	
Desired pH	**gal/acre-ft**	**oz/1000gal**	**gal/acre-ft**	**oz/1000gal**	**gal/acre-ft**	**oz/1000gal**
pH 6.5	29	11	30	12	28	11
pH 4.5	102	40	76	30	107	42
pH 3.0	143	56	101	40	159	62

	Sulfuric Acid		*N-pHuric 15/49*	
Desired pH	**gal/acre-ft**	**oz/1000gal**	**gal/acre-ft**	**oz/1000gal**
pH 6.5	14	5	33	13
pH 4.5	35	14	85	33
pH 3.0	47	18	111	43

What does the buffer curve mean?

- Water samples tell you how much acid is needed to treat water effectively.
  - 6.5 pH to treat water.
  - 4.5 pH for moderate cleaning and mild soil treatment.
  - 2.5 pH shock treatments.

"pH only tells you which way the train is headed, a buffer curve tells you *how fast*."

Shock Treatment

- Run enough N-pHuric to lower water pH to (approx. 2.5)
- Ensure adequate agitation to disperse acid in water column.
- Run for 2-3 hours through poly irrigation system (or until emitters are cleared).
- Stop acid, and flush lines with untreated water.

Acid in SOIL

Sulfuric acid and N-pHuric both react in the same way.

$$H_2SO_4 + CaCO_3 \rightarrow Ca^{++} + SO_4^{2-} + CO_2 + H_2O$$

The application of acids addresses the cause of lime induced chlorosis.

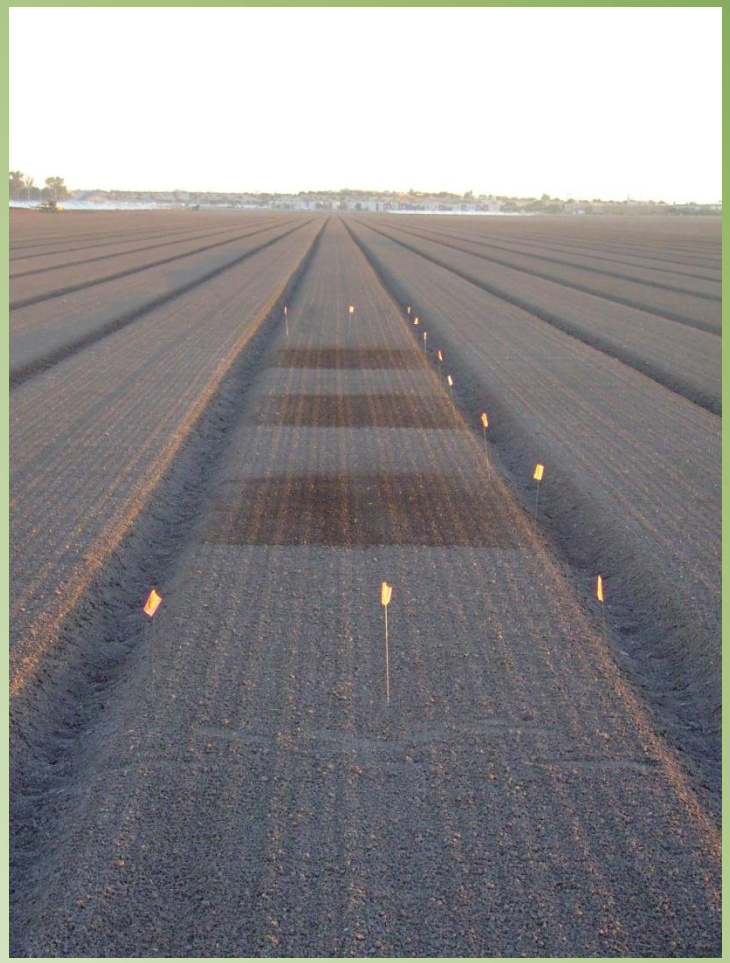
What does it do?

- Solubilizes Calcium.
- Calcium replaces Sodium on clay particles.
  - Ca^{++} has stronger adhesion than Na^{+}
- **Improves soil structure, water infiltration and drainage.**
- Ameliorates Na toxicity.
- Need irrigation to flush salts below root zone.
- Can also solubilize PO_4, Zn, Fe and Mn.

Examples of uses

- Water Treatment
- Drip Grade Fertilizer
  - PO_4 through drip
- Soil Applied Fertilizer
  - Sidedress, Pop-ups, Starters
- Stubble digestion
- Defoliant

Spinach pop-up development



<10-15-0
No Weeds.
0.41 ppm AI

<GSP
No Weeds.
0.45 ppm AI

UTC
(not pictured)
No Weeds.
0 ppm AI

Acid Fertilizer Options

Products:	Compatible Blends:
Sulfuric Acid	**7.5 – 26 – 0**
N-pHuric	3 – 40 – 0
PeK Acid	10 – 20 – 0
Phosphoric Acid	5 – 5 – 5
pHospHuric	2 – 10 – 6
NPKpHuric	6 - 16 - 0
	7 - 7 - 0
	5 – 25 – 5
	5 – 26 – 2

More blend options

- Zn, Fe, Mn Sulfates up to 2% total elemental analysis.
- Zn, Fe, Mn Polysaccharides up to 2% total elemental analysis.
- 15/49 is compatible with Watermaxx2® (soil surfactant)

Components of injection system (Center pivots)

Piston Pump and AC Motor. Poly cylinder and piston. Viton Seals. 1 – 320 gph.

Automatic Controller. Regulates on pH, EC and proportional injection.

pH Probe. Inline or w/ sampling canister.

Varitator Unit. Inverter varies the pump speed based on input from controller.

Components of injection system (center pivots)

pH probe in a sampling canister.

Example of complete setup.

Check pH of Your Water

A good, durable pH meter costs approx. $100. Useful for most applications.

Summary

- Remember the benefits:
  - Treating water and soil.
  - Gains in nutrient efficiency.
  - Source of S and N while solubilizing other elements.
  - Cleans drip systems.

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