microSource
A division of Gavilon Fertilizer, LLC

Alan Robinett
Ozark, AL
334 733 0388

microSource
A division of Gavilon Fertilizer, LLC

# FERTILIZER MANUAL

IFDC

1998

In formulating liquid mixed fertilizers, it is not sufficient to know that all ingredients are water soluble. Many reactions may occur that result in formation of water insoluble compounds of micronutrients.

Solutions for AGRICULTURE

FluidFertilizer.com

Caution: The chart contains information based on the opinions of people in the fluid fertilizer industry. This information has been compiled as a general guide only. Neither the Fluid Fertilizer Foundation or contributors guarantee the accuracy of the information. Please refer to manufacturer's supplier product information and also perform a small jar compatibility test prior to final mixing.

'Compatible', results in generally acceptable mixture.
'Limited Compatibility', generally compatible within solubility limits.
'Very Limited Compatibility', generally unsuitable mixtures.
'Incompatible', unsuitable mixture and/or hazardous combination.
Significant heat generated.


**Fluid Fertilizer Foundation**
2005 Claflin Road, Suite 200
Manhattan, KS 66502

785-776-0273
FluidFertilizer@sbcglobal.net


3/1/09

Anhydrous Ammonia; 82-0-0
Aqua Ammonia; 20-0-0
Urea Solution; 23-0-0
Ammonium Nitrate Solution; 20-0-0
Urea Ammonium Nitrate Solution; UAN 28/32-0-0
Ammonium Sulfate Solution; 8-0-0-9S
Ammonium Polyphosphate Solution; 10-34-0
Ammonium Chloride Solution; 6-0-0-16Cl
Ammonium Thiosulfate Solution; ATS; 12-0-0-26S
Potassium Thiosulfate Solution; KTS; 0-0-25-17S
Calcium Thiosulfate; CaTS; 6%Ca 10%S
Magnesium Thiosulfate; MgTS; 10%S 4%Mg
Calcium Ammonium Nitrate Solution; 17-0-0 8.8Ca
Calcium Nitrate Solution; 8-0-0-11Ca
Potassium Carbonate Solution; 0-0-32
N-pHuric 26/27; 26-0-0-9S
N-pHuric 15/63; 15-0-0-10S
N-pHuric 10/55; 10-0-0-13S
Water
Nitric Acid
Phosphoric Acid (white)
Phosphoric Acid (green)
Sulfuric Acid
Urea; 46-0-0
Ammonium Nitrate; 34-0-0
Calcium Nitrate; 15.5-0-0-19Ca
Potassium Chloride; 0-0-62
Potassium Nitrate; 13-0-46
Magnesium Nitrate; 10-0-0-9Mg
Monoammonium Phosphate (Technical; 12-61-0)
Monopotassium Phosphate (0-52-34)
PeKacid (0-60-20)

Urea
Ammonium Nitrate
Calcium Nitrate
Potassium Chloride
Potassium Nitrate
Magnesium Nitrate
Technical Grade MAP
Monopotassium Phosphate
PeKacid

Clear liquids used to blend with:

## NPK

ATS
Ammonium Chloride
Anhydrous Ammonia ( under closed loop conditions)
Aqua Ammonia
Urea Solution
UAN
AN
Nitrate
APP
Ortho Phosphate
KTS
K Hydroxide
K Acetate
K Carbonate
KCL
CTS
CA Chloride
CAN

## MICROS

Zinc CL
Zinc SO4
Zinc EDTA
Zinc CL+ EDTA
Zn SO4 + EDTA
Zinc NO3
Zinc SO4 + CA or Gluco or Lignin or HA or FA etc.
MN + all the above
Fe + all the above
Cu + all the above
Boron + monoethanolamine
Boron + HA or FA

**Compatibility of various ingredients**

CALCIUM + ATS No Makes CASO4 (Gypsum)
+ KTS No Makes CASO4 (Gypsum)

Exception is a reacted CTS but it will form precipitate over time.
+ APP No Makes Calcium Phosphate (an insoluble compound

ORTHO Phosphate requires a fully chelated Micronutrient

Poly phosphate can tolerate most clear complexes CA and Gluco but not lignin

# REDLINE™

## 6-12-2 With Soygreen® Technology

## GUARANTEED ANALYSIS

| | |
|---|---|
| Total Nitrogen (N) | 6% |
| Available Phosphate ($P_2O_5$) | 12% |
| Soluble Potash ($K_2O$) | 2% |
| Copper (Cu) | 0.05% |
| 0.05% Chelated Copper (Cu) | |
| Iron (Fe) | 0.40% |
| 0.40% Chelated Iron (Fe) | |
| Manganese (Mn) | 0.05% |
| 0.05% Chelated Manganese (Mn) | |
| Zinc (Zn) | 1.0% |
| 1.0% Chelated Zinc (Zn) | |

Derived from urea, anhydrous ammonia, ammonium nitrate, monammonium phosphate, diammonium phosphate, monopotassium phosphate, dipotassium phosphate, copper EDTA, ORTHO-ORTHO iron EDDHA, manganese EDTA, and zinc EDTA.

### GENERAL RECOMMENDATIONS

**Redline®** contains many nutrients that are necessary for plant growth as well as the same technology that is used in Soygreen® that enhances plant growth and development. **Redline®** may be used as a soil or foliar application to any food or fiber crop where the addition of one or more of the nutrients contained in Redline® would be beneficial.

When used along with sound agronomic practices, **Redline®** will enhance plant growth and increase early season root development to maximize yield potential.

**Redline®** can enhance the yield potential of many crops including corn, dry edible beans, potatoes, sugarbeets, sunflowers, and wheat.

### DIRECTIONS FOR USE

**SOIL**

Apply 1 to 5 gallons per acre as a starter fertilizer or as a soil applied broadcast application in a balanced fertility program. Water may be added to increase application rate.

**POSTEMERGENCE**

Apply 1 to 3 gallons per acre to an actively growing crop to supplement an existing fertilizer program or to correct an existing nutrient deficiency. Postemergence applications should be made in a minimum of 10 gallons per acre of water.

3 gallons of **Redline®** contains approximately 1 lbs. of Soygreen®.

### PRECAUTIONARY STATEMENTS

**CAUTION: Redline®** is considered to be a low health hazard and a non-inhalation hazard. Always follow good industrial hygiene practices. Harmful if swallowed. If conscious, immediately give large quantities of water and induce vomiting. Seek medical attention immediately. Avoid contact with skin. In the event of skin contact, flush immediately and thoroughly flush with water. Causes eye irritation. Flush eyes immediately and thoroughly with water for 15 minutes. If irritation persists, seek medical attention.

### ENVIRONMENTAL HAZARD

In the case of a spill, contain spill andmaximize recovery.

### CONDITIONS OF SALE AND WARRANTIES

Seller warrants that the product conforms to its chemical description and is reasonably fit for the purpose stated on the label only when used in accordance with label directions under normal conditions of use. SELLER MAKES NOT OTHER EXPRESS OR IMPLIED WARRANTIES EITHER OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE. IN NO CASE WILL SELLER BE HELD LIABLE FOR CONSEQUENTIAL, SPECIAL OR INDIRECT DAMAGES RESULTING FROM THE HANDLING, STORAGE, OR INCORRECT USE OF THIS PRODUCT.

NET CONTENTS: 250 GALLONS
10.50 lbs per Gallon

WEST CENTRAL, Inc.
World Class Solutions™

West Central, Inc.
P.O. Box 897
Willmar, MN 56201
800.242.4277
www.westcentralinc.com

**CAUTION**
KEEP OUT OF REACH OF CHILDREN
**STOP**
READ ENTIRE LABEL BEFORE USING

03/1510

# GREEN Ammonium Polyphosphate

# Potassium Thiosulfate

# Zinc Ligno-sulfonate representative of MN CU etc.


COPPER 7.5
Cu 7.5%, N 7%
1-855-864-2767
ZINC 9
Zn 9%, N 8%
1-855-864-2767
ZINC 10
N 8%, Zn 10%
AMMONIATED ZINC
Zn 20%, N 16%
EDTA MAN 6
N 6%, Mn 6%
CU Chelate
ZN Chelate
Zinc Complex
Ammoniated
MN Chelate

# Chelation

The objectives of the chelation process in soils are:

- To increase the availability of the nutrient
- To prevent mineral nutrients from forming insoluble precipitates
- To reduce toxicity of some metal ions to plants
- To increase the mobility of plant nutrients

microSource
A division of Gavilon Fertilizer, LLC

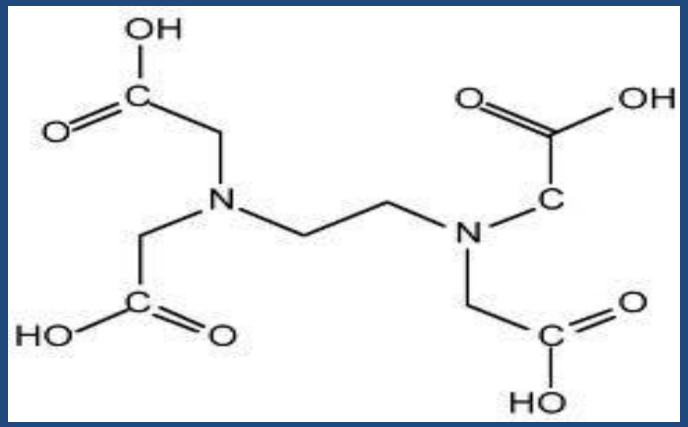
The objective of Chelation in liquid fertilizers is primarily for compatibility.

Prevent the formation of insoluble compounds

Also to prevent salt damage in the case of sulfates.

# EDTA Structure and Sample

EDTA's are clear in color, water soluble and protect the associated metal from reacting with other ingredients. They are expensive per unit of nutrient however will mix with almost anything, including orthophosphates. Most effective in the soil.




microSource
A division of Gavilon Fertilizer, LLC

# Orthophosphate

-Orthophosphate is derived from White Acid that is typically 75% acid solution with an analysis of 0-55-0.

-The product is typically used in industrial applications and is free of impurities and is often referred as food grade acid.

-When used for fertilizer, it is reacted with ammonia, urea Liquor, or potassium hydroxide to neutralize the acid. This will make commonly known blends of 0-20-20, 9-18-9, or 3-18-18.

microSource
A division of Gavilon Fertilizer, LLC

# Benefits of Orthophosphate

-Clean and clear with very few impurities
-Little to no precipitate formation in storage tank
-Low salt, can be put direct on the seed
-Phosphate is in ortho form and immediately plant available

-However, product is typically more expensive than other liquid phosphates.
-Must use EDTA micro's to add to mix.

microSource
A division of Gavilon Fertilizer, LLC

# Superphosphoric Acid

Commonly called polyphosphate, contains polymers which enables the solution to hold more P, and has the ability to hold its metal cations in solution when they would otherwise precipitate or settle out.

Typically an 85% acid solution, with an analysis of 0-68-0.

Green in color and when reacted with water and ammonia to neutralize the acid, this makes polyphosphate products 10-34-0 and 11-37-0.

microSource
A division of Gavilon Fertilizer, LLC

Is this what you look like when you make a new mixture?