

Application Guide



Tessenderlo Kerley

12-0-0-26S

GUARANTEED ANALYSIS

Nitrogen (N).....	12%
(As Ammoniacal Nitrogen)	
Sulfur (S).....	26%
(Derived From: Ammonium Thiosulfate)	

Density:

Density, lbs/gallon @ 60°F.....	11.10
Volume, gallons/ton.....	181.00

GENERAL INFORMATION

Thio-Sul is the original nitrogen-sulfur plant nutrient solution instrumental in unlocking the full potential of your fertility program. Thio-Sul is a clear liquid containing 12% N and 26% S and is the most popular S-containing product used in the fluid fertilizer industry. Thio-Sul is compatible with N solutions and complete (N-P-K) liquid blends, which are neutral to slightly acid in reaction. In addition to its wide adaptability for use in clear liquid blends, it is also well suited for use in suspensions.

Thio-Sul cannot be used with acidic (pH <6.0) materials.

See MSDS Sheet for additional information on safety and handling or visit our website at: www.tkinet.com

Thio-Sul aids in increasing crop yields and stretching fertilizer dollars by improving the Nitrogen-Sulfur balance and helps in maintaining necessary sulfur levels in sulfur deficient soils. Thio-Sul helps solubilize and aids in plant assimilation of other essential plant nutrients, such as phosphorus, and increases plant utilization of several micronutrients, i.e., zinc, manganese, iron and copper.

Thio-Sul contains nitrogen in the ammoniacal form and sulfur as thiosulfate. Thiosulfate sulfur is unique in that it exists in two oxidation states. This gives it enhanced pathways of availability more suitable to the sulfur uptake patterns of most plants. When applied to soils, Thio-Sul decomposes to give approximately equal parts of sulfate S (SO_4^{-2}) and elemental sulfur (S^0). The sulfate sulfur is immediately available for plant uptake, whereas the S^0 must undergo oxidation to SO_4^{-2} before it can be absorbed by plants.

Thiosulfate as a Sulfur Source. The advantage of thiosulfate, in comparison to other sulfur forms, is that the sulfur needed for plant growth becomes available or oxidized in 1-2 weeks. When sulfur is applied totally in the sulfate form, some may be lost to leaching—the result of rainfall and/or irrigation water moving this form below the root zone.

Thio-Sul is often applied in combination with UAN solutions and aqua ammonia in supplying the sulfur needs of crops.

Thio-Sul as a Nitrogen Stabilizer. University research has shown Thio-Sul acts as a nitrification inhibitor when blended

with UAN solution resulting in more nitrogen being available to the crop. Thio-Sul, when added to UAN solution at a 10 to 20% volume-to-volume ratio, delays nitrification, resulting in a decrease of potential losses from nitrate nitrogen leaching.

Thio-Sul, when added to UAN solution or aqua ammonia, allows the plant to better utilize the applied nitrogen. Not only does Thio-Sul stabilize the nitrogen for plant use, but it is an excellent source of sulfur as well.

Thio-Sul contains 1.32 pounds of nitrogen and 2.87 pounds of sulfur per gallon. Thio-Sul weighs 11.01 pounds per gallon. (See Tessengerlo Kerley blend sheets for further information.)

Nitrogen and sulfur are important components of proteins. Sulfur deficiency may affect the plant's ability to utilize nitrogen for protein synthesis. For best management practices and utilization of nitrogen and sulfur, apply Thio-Sul with enough UAN solution or aqua ammonia to make an N: S ratio of 5:1. Plant tissue analysis is recommended to determine crop's sulfur need.

Most crops need between 20 and 50 pounds of sulfur (8 to 18 gallons of Thio-Sul) per acre per crop per year depending upon local growing conditions, soil type, fertilizer placement, crop and yield potential. For best results, follow soil and plant tissue analysis guidelines on sulfur nutrition for crops in your area.

GENERAL APPLICATION AND USE RECOMMENDATIONS

SEE CAUTIONS BEFORE APPLYING

SOIL APPLICATION

Row and Vegetable Crops (starter fertilizer): Apply Thio-Sul as a band application 2 inches to the side and 2 inches below the seed row at 1 to 3 gallons per acre by itself or in combination with other liquid fertilizers.

Row and Vegetable Crops (sidedress): Inject 6 to 12 gallons of Thio-Sul per acre to meet the crop's sulfur requirement. If injection applications are made close to the row (less than 12 inches), reduce application rate by half (3 to 6 gallons per acre). Avoid root pruning. For preplant soil injection application, Do Not apply Thio-Sul where it will be in direct seed contact.

Trees and Vines (soil injection and surface banding): Apply 5 to 10 gallons of Thio-Sul per acre early in the growing season for sulfur nutrition. Avoid pruning roots during injection application.

Trees and Vines (broadcast): Apply 10 to 12 gallons of Thio-Sul per acre in a broadcast spray by itself or mixed with water and/or other liquid fertilizers. For young trees and vines apply 5 to 8 gallons per acre. Prevent spray and drift from contacting drop foliage and tree bark.

FERTIGATION

SPRINKLER IRRIGATION

Row and Vegetable Crops: Apply 1 to 5 gallons of Thio-Sul per acre with the irrigation water. Apply at planting or wait until the crop is at the 3rd or 4th leaf stage. Repeat as needed every 7 to 14 days. Thio-Sul may be mixed with nitrogen solutions (UAN) and applied as needed during the season.

Trees (under): Apply 5 to 10 gallons of Thio-Sul per acre with the irrigation water every 7 to 10 days beginning at full leaf stage.

Trees (over): Apply 3 to 4 gallons of Thio-Sul per acre with the irrigation water every 7 to 10 days beginning at full leaf stage.

Vines: Apply 2 to 4 gallons of Thio-Sul per acre with the irrigation water every 10 to 14 days.

Alfalfa: Apply 5 to 10 gallons per acre of Thio-Sul with the irrigation water after cutting.

FLOOD AND FURROW IRRIGATION

Thio-Sul may be applied with the irrigation water. For best management practices, applications should be made when the crop may best utilize the nitrogen and sulfur. Apply 5 to 10 gallons per acre of Thio-Sul on lighter soils and 8 to 12 gallons per acre on heavier soils. Apply throughout majority of the crop's irrigation period.

Row and Vegetable Crops: Apply 5 to 10 gallons of Thio-Sul per acre per application with the irrigation water.

Trees and Vines: Apply 5 to 10 gallons of Thio-Sul per acre per application with the irrigation water.

Alfalfa: Apply 4 to 8 gallons per acre of Thio-Sul to seedling alfalfa with the irrigation water. Apply 5 to 10 gallons per acre with the irrigation water to an established crop.

DRIP IRRIGATION

Row and Vegetable Crops (drip tape and subsurface drip): Apply 1 to 2 gallons of Thio-Sul per acre per treatment with a full irrigation. Repeat application, as needed, every 7 to 10 days to provide adequate sulfur nutrition.

Trees and Vines (subsurface drip): Apply 2 to 4 gallons of Thio-Sul per acre per treatment with a full irrigation. Repeat application after 14 to 21 days, or as needed, to provide adequate sulfur nutrition.

Trees and Vines (drippers and mini sprinklers): Apply 6 to 8 gallons of Thio-Sul per acre with a full irrigation. For young trees and vines apply 2 to 4 gallons of Thio-Sul per acre with a full irrigation. Repeat application in 14 to 21 days.

TOPDRESSING

Pastures and Small Grains Only: Apply Thio-Sul along with nitrogen solutions (UAN) to provide adequate sulfur nutrition. For every 5 to 7 pounds of nitrogen, apply 1 pound of sulfur. Application on small grains should be done before jointing (Feekes Growth Stage 5). See cautions. Tissue testing is recommended.

Alfalfa: Apply 5 to 10 gallons of Thio-Sul with a ground sprayer immediately after a cutting or during dormancy before regrowth has occurred.

STRAW DECOMPOSITION

Thio-Sul may be used as an aid to straw decomposition. The effectiveness depends on the time of application, soil moisture and spray coverage on the straw.

While temperatures are still warm, lightly disc or chisel the ground after harvest. Spray a mixture of Thio-Sul and water over the stubble. Wait at least 6 weeks before another field cultivation. Apply 3½ to 4½ gallons of Thio-Sul for every ton of straw to be treated. Example: 2.5 tons of straw per acre would require at least 9 gallons of Thio-Sul per acre. Thio-Sul should be mixed in enough water or UAN/water solution to supply a minimum of 20 gallons of spray solution per acre. To be effective, thorough spray coverage of the straw is essential.

CAUTION (APPLICATION)

Do not apply Thio-Sul directly on or below germinating seeds such as in a "pop up" fertilizer program. Reduced germination may result from dry soil conditions and when used in starter fertilizer blends.

Sprinkler irrigation - Application of Thio-Sul by sprinklers should be followed by 1 to 2 hours of additional irrigation to reduce the possibility of fertilizer injury. Always apply Thio-Sul with a full irrigation and avoid application during mid-day when temperatures are high.

Center pivot application of Thio-Sul at recommended rates is diluted with enough water that foliar burning is not normally a problem.

Thio-Sul should not be mixed with acids or other acidic material below a pH of 6.0.

DO NOT APPLY AS A FOLIAR SPRAY ON TREES OR VEGETABLE CROPS

TOPDRESSING

Do not topdress (by airplane or ground rig) with Thio-Sul when temperatures are above 70° F and relative humidity is below 30%. Some foliar burn may occur even under the best of conditions. When working with a new formulation or application method, always do a small test plot before treating the whole field.

A jar test is recommended when mixing with pesticides to check for physical compatibility. When mixing Thio-Sul or any liquid fertilizer with pesticides, always keep agitators running during filling and spraying operations. Failure to maintain agitation may cause separation of products, resulting in uneven spray application, which may result in phytotoxicity occurring to targeted crop.

SOIL INJECTION

Avoid pruning roots with injection equipment when applying Thio-Sul.

Crop injury may result from unusual weather conditions, failure to follow label directions, or improper application practices, all of which are out of control of the manufacturer or seller. The directions on this label are believed to be reliable and should be followed carefully.

The application of Thio-Sul for purposes other than listed herein is not recommended.

Thio-Sul Delivers Results!

- Slows down nitrification, reducing risk of leaching nitrates
- Is an excellent source of sulfur
- Can be mixed with liquid materials in the same manner as UAN or 10-34-0 (11-37-0)
- Versatile – may be used as a 2" x 2" starter, broadcast, early topdress and through irrigation water
- Increases fertilizer efficiency. Keeps nitrogen in the NH⁴⁺ form (enhances phosphorus uptake)
- Inhibits nitrogen losses when applied as surface banding to pasture or wheat ground
- Helps reduce ammonium volatilization losses when applied with UAN or other liquid ammonium or urea fertilizer products

PRODUCT ANALYSIS

Total Nitrogen (N)..... 12%
(As Ammoniacal Nitrogen)
Total Sulfur (S)..... 26%
(Derived From: Ammonium Thiosulfate)

Density pounds per gallon at 60° F.....11.10
Gallons per ton..... 181.00
Salting out temperature ° F..... 43°F to 45°F
Typical pH 7.2 - 8.00

Tessengerlo Kerley, Inc. warrants only that this product conforms to the product description on the label. Tessenderlo Kerley, Inc. makes no representation or warranty or guarantee, whether expressed or implied, disclaims any warranty of fitness for a particular purpose of merchantability, or of product performance. Tessenderlo Kerley, Inc. does not authorize any agent or representative to make any such representation, warranty or guarantee. Tessenderlo Kerley, Inc.'s maximum liability for breach of its warranty or for use of this product, regardless of the form of action, shall not exceed the purchase price of this product. Buyer and user acknowledge and assume all risks and disposal liability resulting from handling, storage, use and disposal of this product, whether in accordance with directions or not. If buyer does not agree with or accept these warranty and liability limitations, buyer may return the unopened container to the place of purchase for full refund. Some states do not allow the exclusion of implied warranties or the limitation of certain damages, so the above may not apply. The purchase, delivery, acceptance and use of this product by the buyer is subject to the terms and conditions of seller's sales invoice for this product.



P.O.Box 15627 • Phoenix, Arizona 85060 U.S.A.
602-889-8300 • 800-525-2803
e-mail: info@tkinet.com • website: www.tkinet.com