

APPLICATION GUIDE

100% SOLUBLE CALCIUM

CALCIUM THIOSULFATE

O-O-O-10S-6Ca

LIQUID FERTILIZER

CaTs®

Soluble Calcium (Ca)	6%
Combined Sulfur (S)	10%
Density: pound per gallon at 68°F	10.4
Volume: gallons per ton	192

GENERAL INFORMATION

CaTs is a neutral to basic, chloride-free, clear solution, containing 6% calcium and 10% thiosulfate sulfur. Each gallon of CaTs contains 0.63 pound of calcium (Ca) and 1.0 pound of thiosulfate sulfur (S). CaTs may be applied by drip, sprinkler, flood irrigation, surface broadcast, banded or watered in. It may be blended with other fertilizers or applied as a foliar treatment on selected crops. When used as a foliar fertilizer, **CaTs should first be diluted with water before applying. Blends of CaTs should not be acidified below a pH of 6.0.**

CaTs may be used as a fertilizer for the correction of calcium and sulfur deficiency as well as a soil amendment. As a soil amendment, CaTs may be used to improve water infiltration and aid in leaching of harmful soil salts.

CaTs is compatible with most fertilizer solutions. **CaTs is not compatible with phosphate, sulfate and ammonium thiosulfate fertilizers.** In absence of specific

recommendations and data, do a jar test before mixing large quantities. The addition of water to the mixture may be helpful to maintain blend stability.

When blending with micronutrients and pesticides, trial blends should be made before mixing large amounts. When mixing other liquid fertilizers and/or pesticides with CaTs, the blend sequence should be as follows: water, pesticide, CaTs and/or other fertilizer.

The purpose of this guide is to provide information about this product and to make suggestions regarding its use. This guide does not make recommendations about the amount of calcium and sulfur needed for optimum crop production or leaching soil salts. The rate of each application of CaTs should be made based on a soil test, soil release rate test and/or plant tissue analysis for calcium and sulfur, and on the recommendations of a Certified Crop Advisor, Pest Control Advisor or authorized CaTs distributor.



SOIL AMENDMENT AND FERTILIZER

CaTs DELIVERS MAXIMUM EFFICIENCY

APPLICATION & USE RECOMMENDATIONS

See Application Precautions on
Page 5 Before Applying

CaTs may be applied to a variety of soils as an amendment to aid in displacing sodium or as a fertilizer for crops, including turf, ornamental, greenhouse, fruit, row and other commercial agricultural crops. Calcium requirements for most crops increases during periods of rapid growth and early fruit development. Applications of CaTs should be made based on soil, fruit and/or plant tissue analysis for calcium.

CaTs can be blended with UAN or urea solution in any ratio to supply nitrogen. CaTs is recognized by the American Association of Plant Food Control Officials (AAPFCO) as a nitrogen stabilizer. When applied in a surface band or with drip irrigation, CaTs can reduce ammonia loss from urea based fertilizers. For more information, please contact a Crop Vitality Specialist.

SOIL AMENDMENT

The Calcium in CaTs is 100% soluble making it a more efficient soil amendment at displacing sodium than gypsum. CaTs may be broadcast or band applied to the soil surface to reduce crusting problems and improve water infiltration.

For preplant applications to improve soil tilth and water infiltration, apply 30 to 40 gallons of CaTs per acre with irrigation water. For band applications, apply at the rate of 1 gallon per acre per inch of band width. (An 8 inch band would require an 8 gallon per acre rate.)

CaTs may be used in-season as a soil amendment to reduce the harmful effects of sodium. CaTs may be applied with irrigation water or directly to the soil before irrigation. Rate of application is dependent on severity of the sodium problem, which should be determined by lab analysis.

IRRIGATION WATER TREATMENT

Irrigation water derived from snowmelt or rainwater may contain low levels of salts (low electrical conductivity). While this is good for crops, it can have a negative effect on water

infiltration in many soils, resulting in puddling, runoff and/or soil erosion. Crops become moisture stressed during periods of high temperatures due to lack of deep moisture and/or a shallow root system.

Applications of CaTs can:

1. improve water infiltration
2. increase deep moisture
3. displace harmful salts
4. reduce moisture stress

Application rates are dependent on field conditions.

SOIL APPLICATION

For preplant treatment, apply 30 to 40 gallons per acre with irrigation water depending on the salt content in the soil that requires leaching. CaTs may be broadcast, banded or knife injected as a source of calcium and sulfur. Rates may vary between 15 to 40 gallons per acre. CaTs can be used in a program to reduce problems related to calcium disorders in tree fruit. Soil application of CaTs should be used (and is more effective) in conjunction with a foliar calcium program.

Apples, Pears, Apricots, Cherries, Peaches, Filberts:

Producing trees (at least 5 years old) on sandy loam soil – apply 20 to 30 gallons per acre in a 4 foot band under the drip line. Irrigate after application.

Young Trees, Vine Crops or Planted to Sandy Soils: Apply 15 to 20 gallons per acre. Irrigate after application.

Example: A 10 acre orchard at 20 gallons per acre would require 200 gallons applied in a 4 foot band.

FERTIGATION

Fertigation is the practice of injecting soluble fertilizers through irrigation systems using water as a nutrient delivery system to the crop.

Before injecting CaTs into an irrigation system, make sure that the irrigation system is in good condition and provides uniform distribution to the field. Application of nutrients like CaTs should be made in the middle third or second half of an irrigation set.

- The injection of CaTs should be done slowly, and should last at least as long as it takes irrigation water to travel from the point of injection to the last emitter or sprinkler in the field.

- The injection of CaTs should be done with a fertilizer injection pump and should be done over a 1 to 4 hour time period.
- Rapid injection of CaTs may lead to uneven distribution of fertilizer and may cause crop damage.

For additional information about injection of nutrients into an irrigation system, consult with your local agronomist and review University of California publication 21620 “Fertigation with Microirrigation,” or University of Florida Bulletin #250 “Injection of Chemicals Into Irrigation Systems: Rates, Volumes, and Injection Periods.”

All rates listed are for established crops on medium to fine textured soils (suggested rates are for trees and vines at least 4 years old or older). Avoid application to new plantings until crop is well established. For sandy soils, suggested rates should be reduced by 50%. Do not apply CaTs when crops are experiencing heat or moisture stress.

SPRINKLER/CENTER PIVOT IRRIGATION

Apples: Apply 5 to 10 gallons per acre per application. Repeat as needed to achieve calcium tissue levels desired.

Young Tree and Vine Crops: Apply 3 to 8 gallons per acre per application. Repeat as required.

Mature Tree and Vine Crops: Apply 5 to 10 gallons per acre per application. Repeat as required.

Potatoes: Apply 10 to 15 gallons per acre per application beginning at hooking stage. Apply a second application when the potatoes are about golf ball size.

Onions: Apply 10 to 12 gallons per acre beginning after third leaf stage. Apply 2 to 3 times with at least 1 week intervals.

Alfalfa: Apply 10 gallons per acre applied after the first cutting and again after the third cutting.

Other crops: Apply 5 to 10 gallons per acre per application. Repeat as required.

Ornamentals: Apply 1 quart of CaTs per 1000 square feet in irrigation water to growing plants. Rinse off any contact with foliage immediately.

Turf: Apply CaTs in irrigation water at 30 to 40 ounces per 1000 square feet. Apply as needed during the growing season as indicated by soil and tissue testing.

FLOOD AND FURROW

Row Crops: Apply 10 to 15 gallons per acre per application with irrigation water to improve water infiltration and to reduce runoff. Apply as needed during the growing season.

Tree Crops: Apply 10 to 15 gallons per acre per application with irrigation water to improve water infiltration and to

reduce runoff. Apply as needed during the growing season.

DRIP IRRIGATION/MICRO-SPRINKLERS

Young Tree and Vine Crops: Apply 4 to 8 gallons per acre per application during the growing season. Allow 10 to 14 days between applications.

Mature Trees and Vine Crops: Apply 5 to 10 gallons per acre per application. Repeat two to three times during the growing season or as needed. Allow 7 to 8 days between applications.

Vegetable and Row Crops: Apply 3 to 5 gallons per acre per application. Repeat 4 to 5 times during the growing season as needed.

FOLIAR APPLICATION

Apply in sufficient volume to achieve good plant coverage, usually 20 to 30 gallons per acre for row crops.

FIELD CROPS

Alfalfa: Apply 2 to 4 gallons per acre per application. Apply on stubble of previous cutting.

Dry Peas: Apply 1 to 1.5 gallon per acre per application at 1/10th bloom stage.

Lentils: Apply 1 to 1.5 gallon per acre per application at 1/10th bloom stage.

Onions: Apply 6 to 8 gallons per acre after the 3rd leaf stage when crop is well established. Apply 2 to 4 times during the season.

Other Crops: Apply 1/2 to 1 gallon per acre per application. Repeat applications as required.

TREE CROPS

For calcium related disorders, begin applications at petal fall.

Apples (Gala and Red Delicious): Apply 2 to 3 quarts/100 gallons per acre. Apply 4 to 6 times during the growing season.

Pears (Bartlett, D'Anjou, Bosc, Concord and Arirang Asian): Apply 2 to 4 quarts/100 gallons per acre. Begin application at petal fall and continue through the season for 4 to 6 applications appropriately spaced during fruit growth.

Cherries: Apply 2 to 3 quarts/100 gallons per acre beginning at petal fall. Apply every 7 to 10 days up to four times or at the beginning and during a rainfall to reduce cracking.

DO NOT apply CaTs with a crop oil spray. Allow at least 14 days before and/or after an oil spray before applying CaTs as a foliar.

HARVEST THE VALUE FROM 100% SOLUBLE CALCIUM

Combination of other fertilizers and pesticides with CaTs may increase the chances of foliar burn. It is beyond the capability of Tessenlerlo Kerley, Inc. to test all combinations of foliar fertilizers and/or pesticides. The dealer/grower should conduct a test plot when applying with multiple products before beginning large scale applications. **When mixing with unfamiliar products, always do a jar test to check compatibility between all products.**

PHYTOTOXICITY

Plant and leaf injury may occur on some crops when certain weather and growing conditions are present. The user assumes all risks of use and handling.

pH AND CROP PRODUCTIVITY

Soil pH has a direct effect on nutrient availability as well as soil microbial activity. A low soil pH can indicate the presence of high levels of toxic ions such as manganese, iron and/or aluminum while a high pH can indicate the presence of free lime in the soil. Most crops do best with a soil pH between 6.0 and 7.5 for optimum nutrient uptake.

Periodic testing of soils using lab analysis is the only way to determine soil pH and the appropriate course of action to maintain soils at their full productive potential. Minimize or avoid applications of CaTs if the pH of the soil is below 6.0.

EXAMPLES OF BLENDS WITH CaTs

PRODUCT	LBS / TON	ANALYSIS
CaTs	1,600	0-0-9-8S-4.8Ca
KCl (Dry 62%)	290	
Water	110	
CaTs	1,000	4.5-0-0-5S-8.5Ca
CN-9	1,000	
CaTs	1,667	7-0-0-8S-5Ca
Urea (Dry)	304	
Water	29	



Keep out of reach of children. Use caution when handling.

See SDS for additional information on safety and handling at: cropvitality.com/cats

APPLICATION PRECAUTIONS

For information on safety and handling, consult a Safety Data Sheet (SDS) or visit our website at: www.cropvitality.com.

CAUTION: Plant and leaf injury may occur on some crops when certain weather and growing conditions are present. The user assumes all risks of use and handling.

- DO NOT apply CaTs to foliage of crops sensitive (foliar burn) to sulfur.
- DO NOT use high-pressure sprays (greater than 60 psi) when applying CaTs over the top of a crop.
- Use caution when applying fertilizer to crops experiencing extreme heat or moisture stress. Fertilizers are salts which compete with the crop for water. Crops should be hydrated before applying any fertilizer.
- The total rate of fertilizer applied should be split among several irrigations and/or at lower rates per application as temperatures increase.
- DO NOT apply CaTs with knife injectors or other types of fertilizer injecting equipment that may cause root pruning.
- DO NOT apply CaTs foliar with crop oil sprays. Allow at least 14 days before and/or after an application of crop oil before applying CaTs as a foliar.
- DO NOT apply CaTs while chlorinating irrigation system. CaTs will neutralize chlorine.
- Do NOT mix CaTs with acid or acidic fertilizers below a pH of 6.0.
- Avoid injecting acids into irrigation water while injecting CaTs. If the water pH is below 6.0 or the injection point to close, the product could decompose and potentially plug drip system.
- Recommendations are for CaTs only; the addition of other fertilizers at or near the same time could increase the chance of phytotoxicity to the crop. Please allow a minimum of 7 days between injections.
- When mixing CaTs 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.
- Many crops are sensitive to salts during germination. When soil moisture is low, delayed crop emergence and/or phytotoxicity may occur when fertilizer is placed too close to the seed. Do not use CaTs in pop-up fertilizer when soil moisture is limited, soil salinity is above an electrical conductivity of 1.0 or when irrigation is delayed such that germination may be affected.

- Fertigation application of CaTs and other liquid fertilizers to an established crop may cause injury to a crop if:
 - Injection period is less than 60 minutes, which may cause an uneven distribution of CaTs to the crop
 - CaTs rates are higher than suggested
 - Ample irrigation water is not applied immediately before and after the injection of CaTs
- Crop injury may result from unusual weather conditions (heat wave, drought, or hot drying wind), or improper application practices such as injecting fertilizer to quickly all of which are out of control of the manufacturer or seller.
- DO NOT apply CaTs in drip or micro-irrigation systems where calcium and magnesium levels in irrigation water are greater than 100 ppm due to potential plugging of emitters.

For further information contact a Certified Crop Advisor (CCA), Pest Control Advisor (PCA), fertilizer dealer or Crop Vitality Specialist.

TECHNICAL DATA

CaTs

0-0-0-10S-6Ca

PLANT NUTRIENT CONTENT WEIGHT %

Calcium (Ca)	6
Total Sulfur (S)	10

TYPICAL PROPERTIES

Specific Gravity	1.25
pH	6.5 - 8.0
Appearance	Colorless
Salt-Out Temperature	32°F

FORMULATION AND APPLICATION FACTORS, 68°F

Density: pounds per gallon	10.4
Volume: gallons per ton	192
Pounds of Calcium per gallon	0.63
Pounds of Sulfur per gallon	1.0

The manufacturing process of CaTs is patent protected.



Warranty and Limitation of Damages

Tessenderlo Kerley, Inc. (TKI) warrants only that this product conforms to the product description in the Application Guide. Except as warranted by this description, TKI makes no representation or warranty or guarantee, whether expressed or implied, of fitness for a particular purpose of merchantability, or of product performance. TKI does not authorize any agent or representative to make any such representation, warranty or guarantee. To the extent consistent with applicable law, TKI's maximum liability for breach of its warranty or for use of this product, regardless of the form of action, shall be limited to the purchase price of this product. To the extent consistent with applicable law, buyer and user acknowledge and assume all risks and disposal liability resulting from handling, storage, use and disposal of this product. 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. Buyer's use of this product shall constitute conclusive evidence of buyer's acknowledgment and acceptance of the forgoing limitations. Some jurisdictions 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 are subject to the terms and conditions of seller's sales invoice for this product.

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CONTACT INFORMATION

TESSENDERLO KERLEY, INC.

2255 NORTH 44TH STREET, SUITE 300 | PHOENIX, AZ 85008

TELEPHONE: 602-889-8300 | TOLL-FREE: 800-525-2803

EMAIL: INFO@CROPVITALITY.COM | CROPVITALITY.COM

