
TESSENDERLO
Kerley
GRAPES

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PRODUCTS

FERTIGATION PROGRAM

The fertilization of perennial plants, such as vines, primarily consists of managing the equilibrium of the mineral elements present in the soil. An excess will increase plant vigor to the detriment of grape quality, whereas a deficiency will compromise production as well as the long-term quality of the vine. The supply of nitrogen needs to be limited to the replacement of that which is removed from the soil. Vines do not have a high demand for phosphorus and should only require around 30 units per year. Meanwhile, magnesium should be monitored on a case-by-case basis. Finally, calcium export can reach 120 units.

WINE GRAPES

The fertilization of a vineyard is a delicate agronomic operation that has a decisive effect on the quality of the grapes and the resulting wine. The fertilization program must successfully complement the supply of the plant nutrients available in the soil in order to allow the vines to express the full potential of the land. For wine grapes, typically 30-50 units per year of nitrogen should be applied in the case of vines that are not very sturdy. In winemaking, the element potassium is essential for obtaining a good quality must. A production of 60 hl/ha requires 50 to 80 kg K_2O/ha. Availability is most important from the point of fruit formation onwards and throughout ripening.

TABLE GRAPES

The fertilization of vines for table grapes is different to that of vines for wine grapes. For table grapes, yield, size, taste and appearance are the main production objectives, and managing the equilibrium of mineral elements in the soil is the main task. In the case of nitrogen, typically 70-80 units per year are required for a production of 20-25 t/year. The export of potassium in vines for table grape production typically represents 100 to 130 kg K_2O/ha. Availability is most important from flowering to the maturation stage.

RAISINS

In the case of raisins, the drivers for grape fertilization should take into account the specific objective for this production: i.e. the precocity of maturation, the level of sugars, the thickness of the fruit skin, whether or not the variety is seedless, the shape and size of the berry, and its color.

During the early stages of sprouting, nitrogen plays a key role in the development of the plant. Gradually, with the onset of flowering, the nitrogen requirement will reduce, and all other nutrients, such as phosphorus (P), potassium (K) and calcium (Ca), will increase. For raisin yield, the first objective is to obtain maximum fruit set on the bunch of grapes. The trace elements of iron (Fe), boron (B) and zinc (Zn) are also very important in this phase, as they actively participate in all of the metabolic processes from sprouting to fruit setting.

Ripening for raisins is the time when the requirement for potassium significantly increases due to the movement of large amounts of potassium from the leaves to the berries. Potassium is also very important in the synthesis of stored substances such as sugars and pigments.

DORMANCY | VEGETATIVE GROWTH | FL

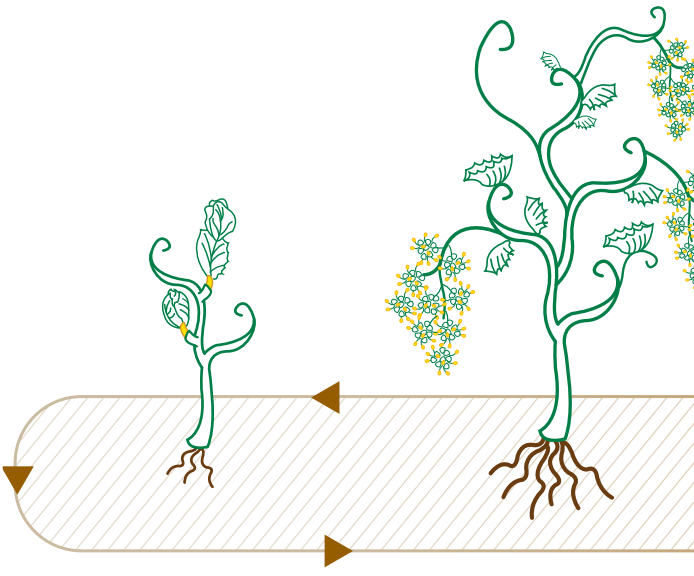
THE GRAPE VINE GROWTH CYCLE

One of the key elements for the fertilization of grapes is to take into account the differences that exist between different grape varieties that are grown. The objectives will differ between table grapes, wine grapes and grapes grown for raisins (dried grapes).

Fertilizer doses and application timings will have to be adjusted according to the requirements of each variety. The requirements for nitrogen, phosphorus, potash, sulfur, calcium and magnesium are unique to each variety and these principles should be applied to existing soil analyses. This is also required in order to adapt fertilizer inputs to nutrients that are already present in the soil.

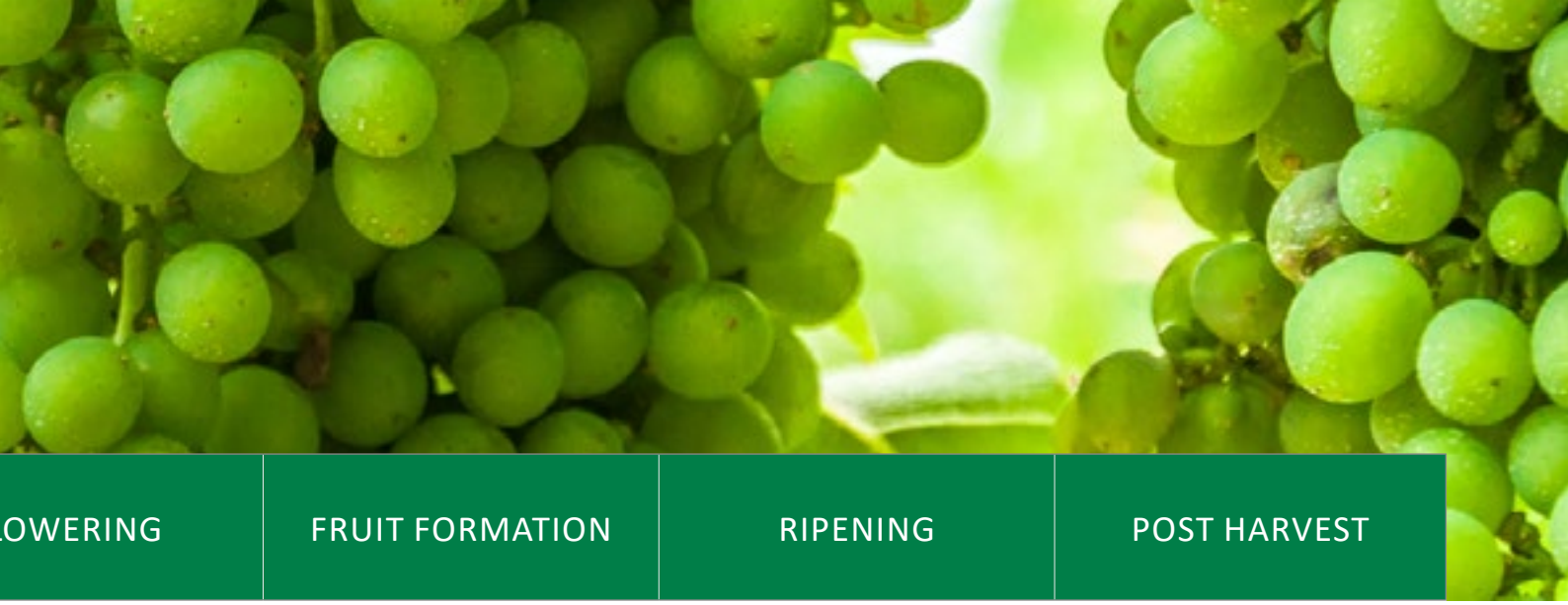
bud break — BBCH 0

start of flowering — BBCH 60



BUD BREAK

BLOOM



LOWERING | FRUIT FORMATION | RIPENING | POST HARVEST

fruit set

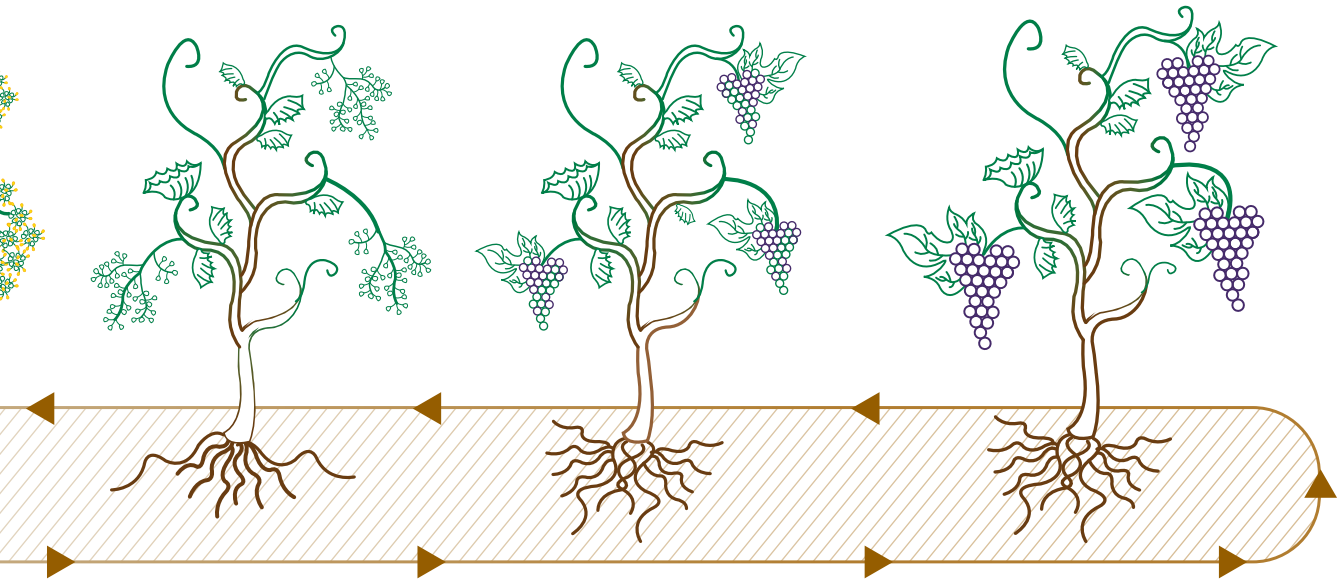
BBCH 70

start of ripening

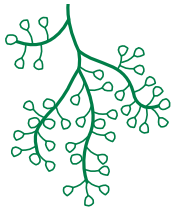
BBCH 80B

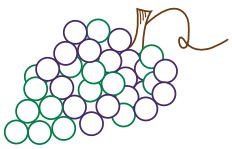
harvest

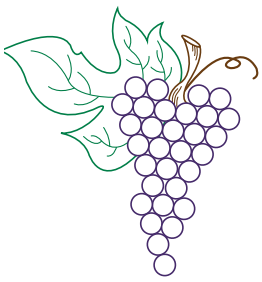
BBCH 90



FRUIT SET VERAISON HARVEST







FERTILIZATION OBJECTIVES

Like all perennial plants, the grape starts its vegetative cycle by using its reserves of carbon and nitrogen, which are mainly located in the roots and the stems.

The growth dynamics of the main perennial and annual parts of the grape are linked, making the nutritional process more complex. In addition environmental constraints can also complicate the fertilization program.

The assimilation of the key nutrients carbon and nitrogen from the soil, and the metabolism and distribution of these, depend on various processes.

After the months of winter rest, the grape will simultaneously ensure the development and growth of its vegetative organs (stems, leaves and roots) and reproductive organs (inflorescences) until flowering. From budding onwards, the leaves and branches will begin to grow. During their growth, the first leaves are initially heterotrophic (using carbon for growth and taking energy principally from reserves in the stems and roots).

They then become autotrophic and use carbohydrates from photosynthesis. During all vegetative growth, magnesium can be a limiting nutrient and the need for magnesium can vary greatly from one grape species to another.

Most of the growth during this blooming period is driven by both nitrogen and carbon. Calcium can help in terms of nitrogen uptake and will influence the berry quality.

After flowering, potassium will help to obtain the full potential from each species of grape as it is a very qualitative nutrient for grapes in regard to yield, maturity and pH control.

NUTRITIONAL REQUIREMENTS OF GRAPE VINES

1. Nitrogen (N)

Nitrogen is the nutrient that promotes the growth and vigor of the grape. This is one of the fundamental elements (macronutrients) of plant nutrition, since it is included in the composition of chlorophyll.

The grape continuously absorbs nitrogen from bud break to ripening, and its greatest need is at three time points: firstly, when active growth restarts, after bud break; secondly, at flowering, whereupon it is frequently found that the nitrogen is not readily available at that time; finally, a third period where nitrogen is very important is when the fruit begins to grow rapidly.

2. Phosphorus (P)

Phosphorus has great importance in the metabolism of carbohydrates. It promotes root development, which increases drought resistance. Furthermore, it attenuates the effects of excess nitrogen and acts on maturation, as well as making the branches stronger. It also decreases the susceptibility to cryptogamic diseases.

Phosphorus is considered to be a quality factor in vineyards that helps to produce balanced musts and intense uptake occurs from germination to flowering. It is also considered to be a regulator of plant development and it plays a role in fruit evolution. Phosphorus also promotes the development of roots and is therefore an essential factor in terms of enabling the plants to settle in the first few years after planting.

3. Potassium (K)

Potassium is an extremely important nutrient in regard to transpiration, chlorophyll uptake, and the transport and storage of carbohydrates in the bunches. Therefore, it helps to increase sugar content and hence alcohol content. It also helps to promote the storage of reserves in different parts of the plants.

Potassium plays a role in crop vigor and yield, and it contributes to the neutralization of formed organic acids. It also promotes respiration and activates growth. This is an important health factor for plants because it facilitates the proper distribution of reserves between different parts of the plant. It intervenes in the regulation of the opening and closing of stomata, it plays a role in improving drought resistance via better water use efficiency, ensuring an improvement in the functioning of the stomata.

Potassium promotes the setting and advances the ripening of the grapes. In addition, it is an element of protection against frost. By intervening in the salification of tartaric acid, it is responsible for the increase and control of the pH of the must.

In wine grapes, a potassium deficiency (corresponding to less than 0.5% potassium in the leaf dry matter) will lead to a reduction in the alcohol level of the wine and it will also weaken the plant. Meanwhile, in table grapes, potassium deficiency will lead to a reduction in the sugar content of the fruit and it will also weaken the vine.

4. Sulfur (S)

Sulfur enters the composition of sulfur amino acids. It plays a role in the aroma of certain grape varieties (white grape varieties specifically) through volatile sulfur compounds.

Sulfur is also a major component in Thiols. These are any of a number of different compounds with the general formula RSH and which are analogous to alcohol but in which sulfur replaces the oxygen of the hydroxyl group. Thiols and sulfur are strongly linked to the taste and aroma of fruit and wine.

5. Calcium (Ca)

Calcium contributes to protein synthesis, root development, and cellular membranes. It is also considered to be an element of quality. Calcium is the dominant element of the intracellular buffer that regulates the pH of the cellular fluid.

Calcium has an important function with other cations (potassium and magnesium) in the neutralization of organic acids and in terms of ensuring the stability of the cell walls. It also participates in various enzymatic reactions.

6. Magnesium (Mg)

Magnesium is a component of chlorophyll that intervenes in carbohydrate synthesis. In the fertilization of the grapes, magnesium contributes to the absorption and migration of phosphorus, and it improves the capturing of iron in grape vines.

Its deficiency appears as chlorosis on the old leaves at the base of branches, which can fall prematurely and cause the appearance of secondary branches. Symptoms are more pronounced on leaves situated close to clusters.

Grape bunches appear less compact and are characterized by significant weight loss. Deficiency occurs by impairment, as well as by antagonism, with calcium and potassium. Magnesium deficiency can occur with light, acidic soils that are prone to leaching or in soils that have received high doses of potassium fertilizers.

NUTRITIONAL REQUIREMENTS OF GRAPE VINES							
	TOTAL	END OF DORMANCY	VEGETATIVE GROWTH	FLOWERING	FRUIT FORMATION	RIPENING	POST-HARVEST
	kg/ha	%					
N	40-80	5%	20%	20%	30%	20%	5%
P_2O_5	20-40	20%	50%	10%		20%	
K_2O	40-110	10%	10%	20%	30%	20%	10%
SO_3	30-75	10%	10%	10%	10%	60%	
CaO	10-35*	20%	10%	20%	20%	10%	20%
MgO	15-25		25%	30%	25%	20%	

Based on quantity of nutrients mobilized - *except calcium (quantity exported)

ABSORPTION OF NUTRIENTS

The absorption of nutrients by grapes depends considerably on the grape variety that is grown.

Generally speaking, for nitrogen the need arises after bud break or after “veraison” for white grape varieties. Meanwhile, for red grape varieties, nitrogen assimilation is more spread out during the cycle, with assimilation peaks after flowering, which can last as far as maturation.

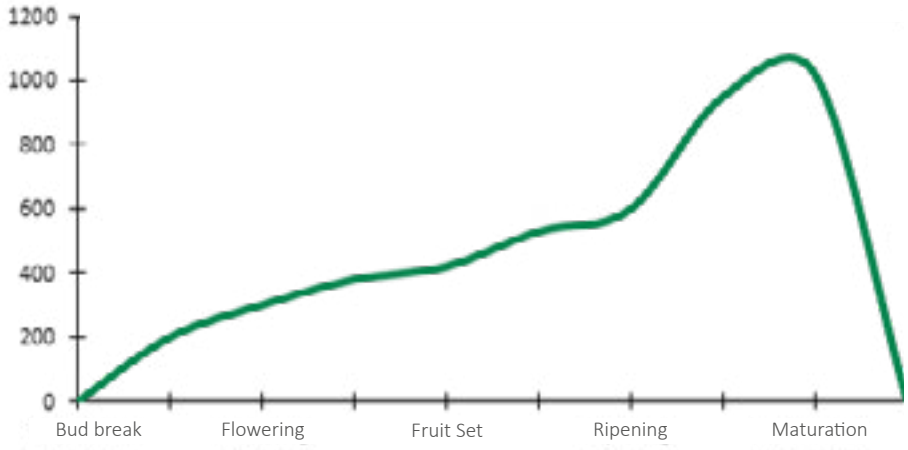
Calcium by nature allows for a better absorption of nitrogen and therefore calcium fertilizer should be provided to the grape vine in anticipation of nitrogen.

For phosphorus, the main inputs will take place between bud break and flowering. However, in some cases, such as with grapes characterized by a high sugar content, assimilation may also take place during maturation.

As regards potassium, some white grape varieties have significant needs at bud break, but generally the grape needs potash fertilization from flowering until maturation. Some red grape varieties may need a potash boost after flowering in order to ensure a good supply of potassium before ripening.

Sulfur is regularly absorbed throughout the growth cycle. Some grape varieties may have a much more pronounced absorption of sulfur during maturation, especially white grape varieties, enabling them to better control the transformation of sugar to alcohol during winemaking.

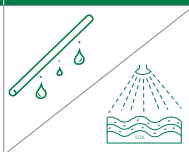
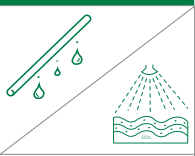
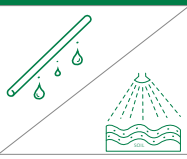
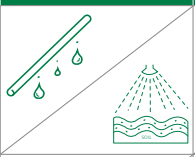
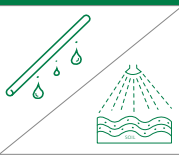
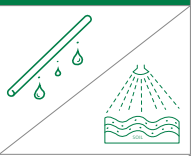
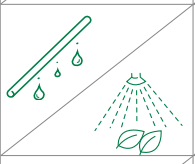
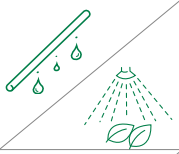
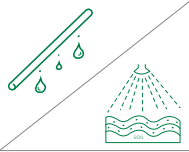
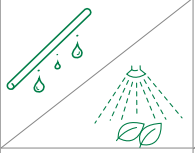
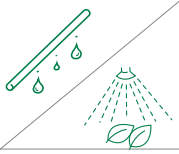
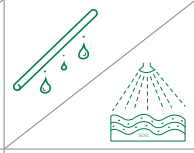
Finally, in terms of magnesium, whilst the need is never very high, it remains a much appreciated nutrient during the entire cycle of the grape vine. Its absorption is stronger from bud break until the beginning of maturation.



Absorption of potassium by vines
(grams K/ha/day)

PRODUCTS

TESSENDERLO KERLEY FERTILIZERS

PRODUCTS	END OF DORMANCY	VEGETATIVE GROWTH	FLOWERING	FRUIT FORMATION	RIPENING	POST HARVEST
Thio-Sul						
KTS						
CaTs						
K-Leaf						
SoluPotasse						
GranuPotasse						

Legend:

Foliar application 

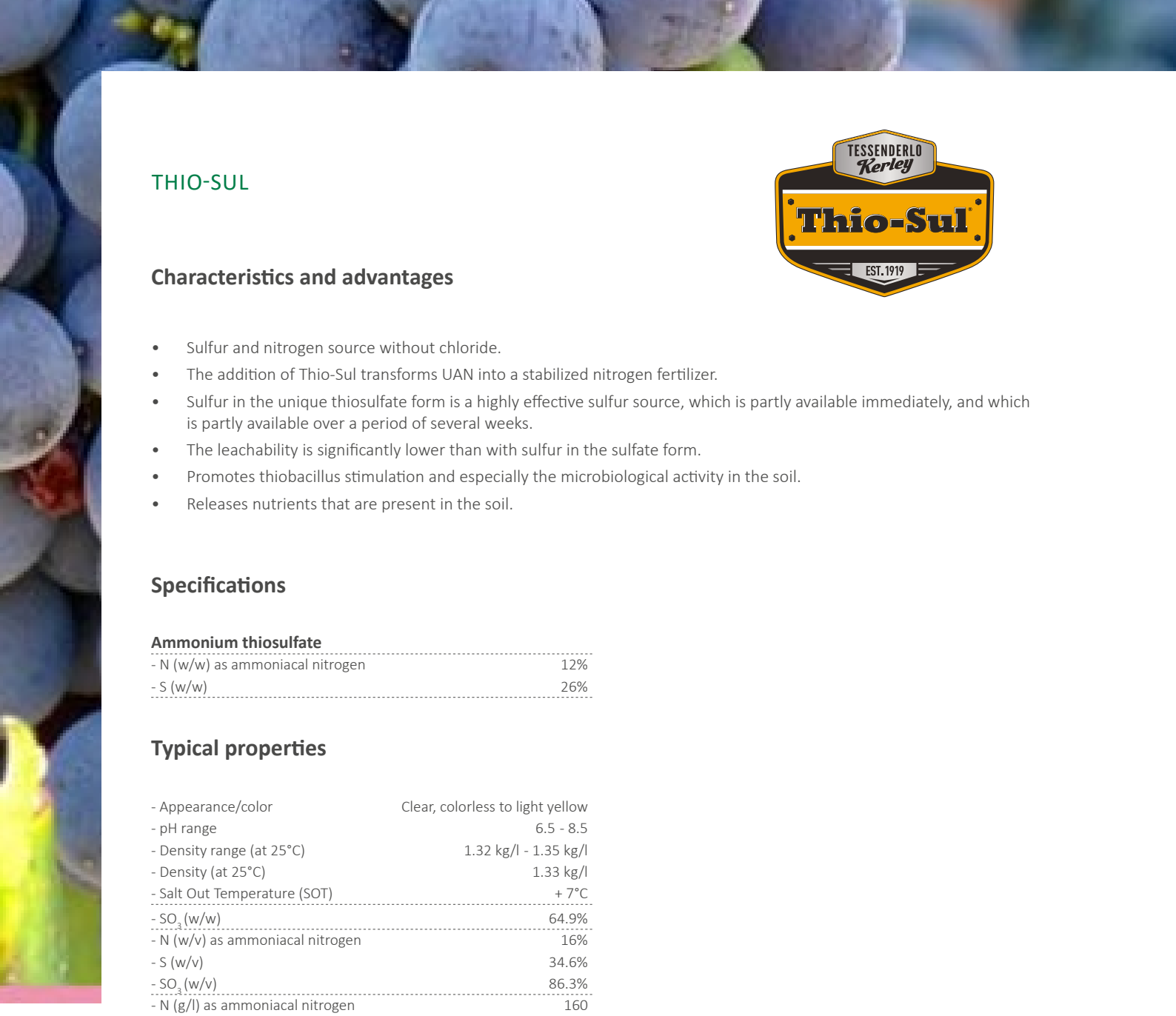
Soil application granules 

Soil application liquids 

Fertigation 

NUTRIENT CONVERSION FACTORS*		
TO CONVERT	TO	DIVIDE BY
CaO	Ca	1.40
MgO	Mg	1.66
K_2O	K	1.20
P_2O_5	P	2.29
SO_3	S	2.50
SO_4	S	3.00

* To convert elemental units to oxide units multiply by the same factors



THIO-SUL

Characteristics and advantages

- Sulfur and nitrogen source without chloride.
- The addition of Thio-Sul transforms UAN into a stabilized nitrogen fertilizer.
- Sulfur in the unique thiosulfate form is a highly effective sulfur source, which is partly available immediately, and which is partly available over a period of several weeks.
- The leachability is significantly lower than with sulfur in the sulfate form.
- Promotes thiobacillus stimulation and especially the microbiological activity in the soil.
- Releases nutrients that are present in the soil.

Specifications

Ammonium thiosulfate	
- N (w/w) as ammoniacal nitrogen	12%
- S (w/w)	26%

Typical properties

- Appearance/color	Clear, colorless to light yellow
- pH range	6.5 - 8.5
- Density range (at 25°C)	1.32 kg/l - 1.35 kg/l
- Density (at 25°C)	1.33 kg/l
- Salt Out Temperature (SOT)	+ 7°C
- SO_3 (w/w)	64.9%
- N (w/v) as ammoniacal nitrogen	16%
- S (w/v)	34.6%
- SO_3 (w/v)	86.3%
- N (g/l) as ammoniacal nitrogen	160
- S (g/l)	346
- SO_3 (g/l)	863
- Chemical formula	$(NH_4)_2S_2O_3$

APPLICATION	DOSE PER APPLICATION	GROWTH STAGE	COMMENT
Soil	50 to 150 l/ha or 35 to 45 l/pruning waste	Early in vegetative growth or during winter	For young grapes limit to 100 l/ha
Fertigation	20 to 40 l/ha	During all seasons	Thio-Sul can be blended with UAN and applied as needed during the season Delay of 10 to 14 days

KTS

Characteristics and advantages

- The concentrated liquid form is ideal for applications in low water volumes and for large areas.
- Active thiosulfate technology enhances the uptake of phosphorus and micronutrients present in the soil or from fertilization.
- The neutral pH level is ideally adapted to tank mixtures with acid or base sensitive materials.
- KTS contains the two key crop nutrients potassium and sulfur, and it is chloride and nitrate free.
- Available in bulk and in 1,000 l containers.
- Can also be applied to the soil as a starter fertilizer (with P-Sure®) and in overhead pivots and sprinklers.
- The thiosulfate form of potassium is taken up rapidly by the leaves.

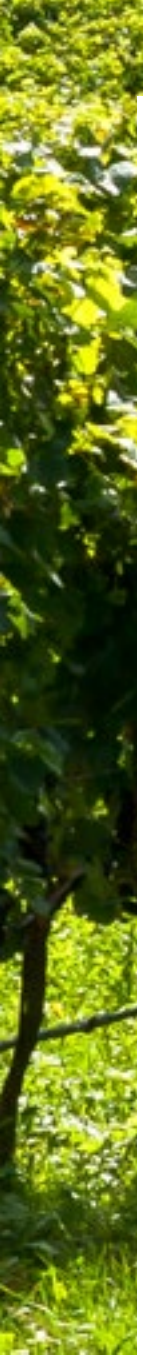
Specifications

Potassium thiosulfate	
- K_2O (w/w)	25%
- S (w/w)	17%
- pH range	6.8 - 8.5
- Density range (at 25°C)	1.45 - 1.49

Typical properties

- Appearance/color	Clear and colorless
- Density (at 25°C)	1.47 kg/l
- Salt Out Temperature (SOT)	- 10°C
- SO_3 (w/w)	42.4%
- K_2O (w/v)	36.8%
- S (w/v)	25%
- SO_3 (w/v)	62.4%
- K_2O (g/l)	368
- S (g/l)	250
- SO_3 (g/l)	624
- Chemical formula	$K_2S_2O_3$

APPLICATION	DOSE PER APPLICATION	GROWTH STAGE	COMMENT
Soil	50 to 100 l/ha	Veraison, fruit formation to ripening until post harvest	50% dose for young grapes/ can be applied just before watering. Apply every 3 to 4 weeks
Fertigation	25 to 90 l/ha	Start at full leaves during flowering	50% dose for young grapes/ clear water during 1 hour after. Apply every 3 to 4 weeks
Foliar	5 to 10 l/ha	Start 2 weeks after flowering	Diluted in 500 l of water Delay of 10 to 14 days between applications



CATS

Characteristics and advantages

- CaTs is a neutral to basic, chloride and nitrate free, clear solution.
- CaTs may be applied by drip, sprinkler, or flood irrigation.
- 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 application.
- 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 deficiency.
- CaTs is an effective water soluble source of calcium and thiosulfate sulfur which assists in the correction of these nutrient deficiencies in crops.
- CaTs may be used to improve water infiltration and assists in terms of leaching of harmful soil salts.
- CaTs is compatible with most fertilizer solutions.
- CaTs is not compatible with phosphate, sulfate and ammonium thiosulfate fertilizers.

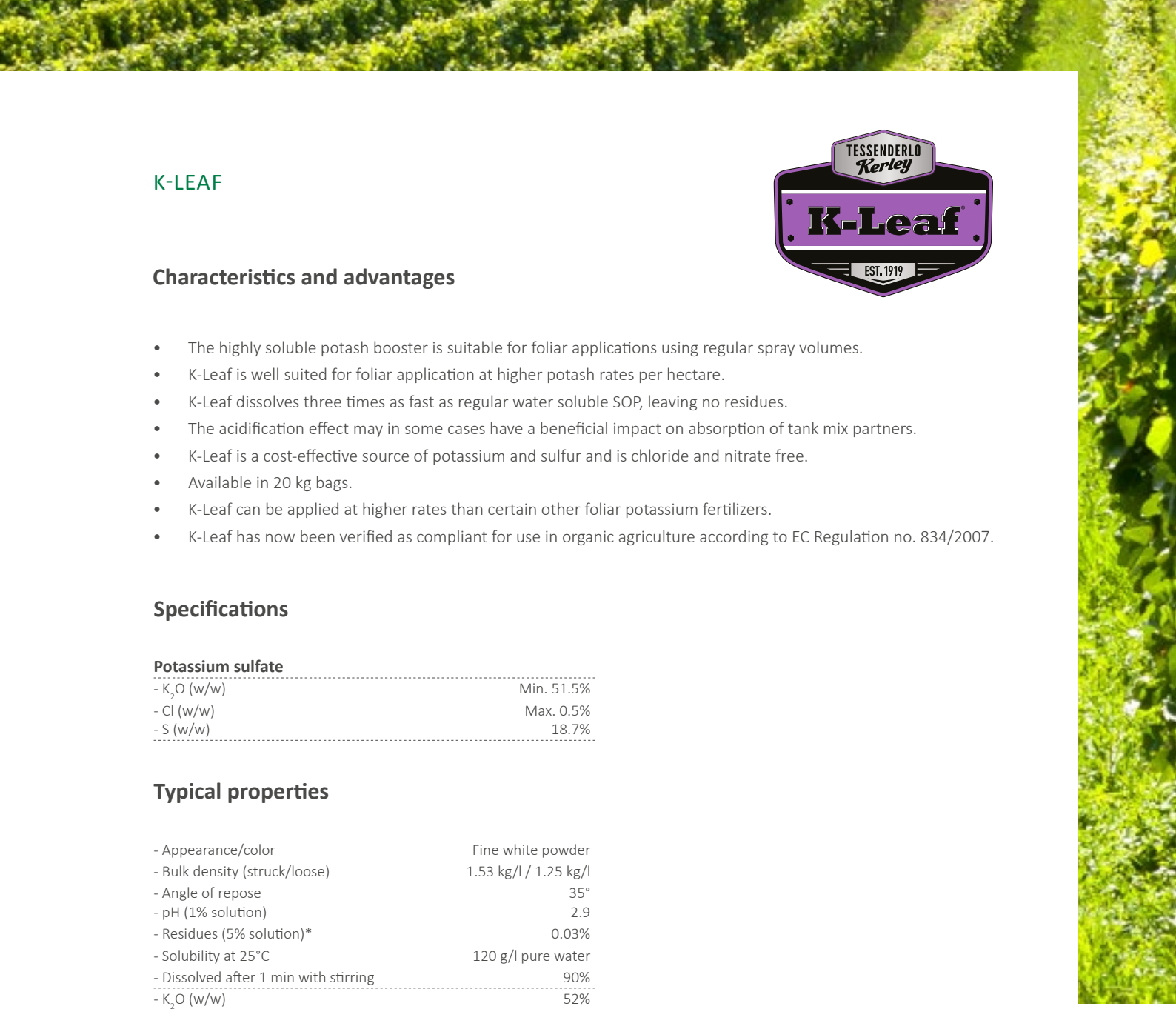
Specifications

Calcium thiosulfate	
- Ca (w/w)	6%
- S (w/w)	10%
- pH range	6.5 - 8.8
- Density range (at 25°C)	1.22 - 1.26

Typical properties

- Appearance/color	Clear and colorless
- Density (at 25°C)	1.25 kg/l
- Salt Out Temperature (SOT)	0°C
- CaO (w/w)	8.4%
- SO_3 (w/w)	25%
- Ca (w/v)	7.5%
- S (w/v)	12.5%
- CaO (w/v)	10.5%
- SO_3 (w/v)	31.2%
- Ca (g/l)	75
- S (g/l)	125
- CaO (g/l)	105
- SO_3 (g/l)	312
- Chemical formula	CaS_2O_3

APPLICATION	DOSE PER APPLICATION	GROWTH STAGE	COMMENT
Soil	10 l/ha/5 cm width	Dormancy, end of winter, bud break	For application on a band of 1 m, total dose can be 200 l
Fertigation	200 to 400 l/ha 20 to 150 l/ha	Before bud break During growing stage	Follow soil analysis 20 to 80 l/ha for young grapes 50 to 150 l/ha for mature grapes Repeat 4 to 5 times
Foliar	5 to 10 l/ha	After flowering	Blend into water volume of 100 to 600 l/ha



K-LEAF

Characteristics and advantages

- The highly soluble potash booster is suitable for foliar applications using regular spray volumes.
- K-Leaf is well suited for foliar application at higher potash rates per hectare.
- K-Leaf dissolves three times as fast as regular water soluble SOP, leaving no residues.
- The acidification effect may in some cases have a beneficial impact on absorption of tank mix partners.
- K-Leaf is a cost-effective source of potassium and sulfur and is chloride and nitrate free.
- Available in 20 kg bags.
- K-Leaf can be applied at higher rates than certain other foliar potassium fertilizers.
- K-Leaf has now been verified as compliant for use in organic agriculture according to EC Regulation no. 834/2007.

Specifications

Potassium sulfate	
- K_2O (w/w)	Min. 51.5%
- Cl (w/w)	Max. 0.5%
- S (w/w)	18.7%

Typical properties

- Appearance/color	Fine white powder
- Bulk density (struck/loose)	1.53 kg/l / 1.25 kg/l
- Angle of repose	35°
- pH (1% solution)	2.9
- Residues (5% solution)*	0.03%
- Solubility at 25°C	120 g/l pure water
- Dissolved after 1 min with stirring	90%
- K_2O (w/w)	52%
- Cl (w/w)	0.2%
- SO_3 (w/w)	47%
- H_2O (w/w)	0.07%
- Chemical formula	K_2SO_4

* After stirring for 10 minutes at 25°C

APPLICATION	DOSE PER APPLICATION	GROWTH STAGE	COMMENT
Foliar	6-12 kg/ha	From 1 week before flowering onwards	2-4% spray solution concentration recommended 3-5 applications

SOLUPOTASSE

Characteristics and advantages

- SoluPotasse is a cost-effective source of potassium and sulfur and is chloride and nitrate free.
- SoluPotasse provides a high concentration of these important crop nutrients.
- SoluPotasse dissolves rapidly and completely, leaving no residues.
- SoluPotasse has an extremely low salt index and is ideal for use in chloride sensitive crop or regions at risk from salinity.
- The acidification effect ensure optimal uptake of all nutrients and helps prevent clogging of the drippers.
- SoluPotasse is of a consistently high quality and is the market leading water soluble SOP for fertigation.
- Available in 25 kg bags and big bags (1000 kg or 1200 kg).

Specifications

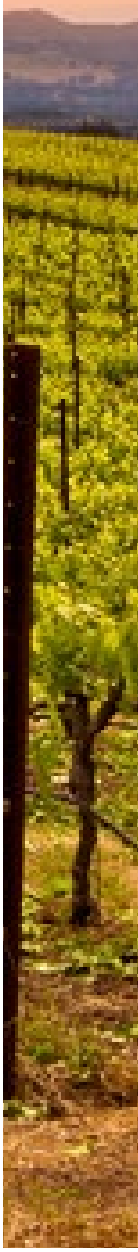
Potassium sulfate	
- K_2O (w/w)	Min. 51%
- Cl (w/w)	Max. 1%
- S (w/w)	18.7%

Typical properties

- Appearance/color	Fine white powder
- Bulk density (struck/loose)	1.46 kg/l / 1.21 kg/l
- Angle of repose	40°
- pH (1% solution)	2.9
- Residues	0.03%
- Solubility at 25°C	120 g/l pure water
- Dissolved after 3 mins with stirring	90%
- K_2O (w/w)	51.5%
- Cl (w/w)	0.6%
- SO_3 (w/w)	47%
- H_2O (w/w)	0.02%
- Chemical formula	K_2SO_4

APPLICATION	DOSE PER APPLICATION	GROWTH STAGE	COMMENT
Fertigation	15 to 40 kg/ha per week 7 to 30 kg/ha per week	During flowering From fruit formation to ripening	Based on weekly applications Table grapes may benefit from higher doses at the end of flowering and beginning of fruit formation

GRANUPOTASSE



Characteristics and advantages

- GranuPotasse is a cost-effective source of potassium and sulfur, and it is chloride and nitrate free.
- GranuPotasse provides a high concentration of these important crop nutrients.
- GranuPotasse is virtually dust-free.
- GranuPotasse has a consistent granulometry that ensures uniform application, with a spreading range of up to 28 meters.
- GranuPotasse is suitable for both pre-emergence and post-emergence application during early stages of crop growth.
- GranuPotasse has excellent stability, which makes it ideal for producing a wide variety of NPK blends.
- Available in 25 kg bags or big bags (600 kg, 1,000 kg or 1,200 kg).

Specifications

Potassium sulfate	
- K_2O (w/w)	Min. 50%
- Cl (w/w)	Max. 2.5%
- S (w/w)	18%

Typical properties

- Appearance/color	Light grey to beige granules
- Bulk density (struck/loose)	1.40 kg/l / 1.27 kg/l
- Angle of repose	33°
- Sieve analysis	97% between 1.6 mm and 5 mm
- K_2O (w/w)	50.2%
- Cl (w/w)	2.3%
- SO_3 (w/w)	45%
- H_2O (w/w)	0.2%
- Chemical formula	K_2SO_4

APPLICATION	DOSE PER APPLICATION	GROWTH STAGE	COMMENT
Soil	80-220* kg/ha	Either post harvest (pre-season) or during the period of dormancy to vegetative growth	Application is by either soil incorporation prior to planting or annually as a basal dressing, preferably along the row.

*Assuming all the potassium is provided in the form of GranuPotasse

FERTIGATION PROGRAM

NUTRIENTS FERTILIZATION FOR GRAPE VINES

	TOTAL	END OF DORMANCY	VEGETATIVE GROWTH	FLOWERING	FRUIT FORMATION	RIPENING	POST HARVEST
Nitrogen (kg N/ha)	40-80	2-6	6-13	6-13	18-24	6-13	2-8
Phosphorus (kg P_2O_5/ha)	20-40	4-8	10-20	2-4	0	4-8	0
Potassium (kg K_2O/ha)	40-110	4-11	4-11	8-22	12-33	8-22	4-11
Sulfur (kg S/ha)	30-75	3-8	3-8	3-8	3-8	21-43	0
Calcium (kg Ca/ha)	10-35 *	2-10	2-3	3-5	3-5	2-3	2-10
Magnesium (kg Mg/ha)	15-25	0	4-6	5-8	4-6	3-5	0

Based on the quantity of nutrients mobilized - *except calcium (quantity exported). The fertigation program is for illustrative purposes only. Many different products are available for use in fertigation and the final product choice will depend on many different factors. Always consult a qualified agronomist beforehand.

TESSENDERLO KERLEY FERTIGATION PROGRAM

	END OF DORMANCY	VEGETATIVE GROWTH	FLOWERING	FRUIT FORMATION	RIPENING	POST HARVEST
LIQUIDS						
Thio-Sul (l/ha)	10-40	40-80	40-80	100-150	40-80	10-50
KTS (l/ha)	10-30	0	20-60	30-100	20-60	10-30
CaTs (l/ha)	20-100	20-30	30-50	30-50	20-30	20-100
WATER SOLUBLES						
SoluPotasse (kg/ha)	0	0	15-45	25-65	15-45	0

GranuPotasse, as a solid fertilizer, can be applied on soil as a potassium and sulfur source.

GUIDELINES

General

- Do not apply products to crops which are sensitive to the effects of sulfur.
- Use the correct type of spray nozzles that are recommended for foliar applications.
- Contact a representative of Tessenderlo Kerley International if you require any additional information.
- The purpose of this brochure is to provide information about fertilizer products and to make suggestions regarding their use in grapes. The exact quantities of nutrients required by the crop will depend on local growing conditions including, but not limited to, soil type and nutrient content, climate conditions; crop variety, target yield, etc.
- Use of tissue and soil analysis to determine crop and soil nutrient status is recommended.
- Tessenderlo Kerley International recommends that you seek advice on your specific fertilization program from a qualified agronomist.

Liquids

- Do not apply products to soils that have a very low pH level.
- Do not apply products when the temperature exceeds 30°C. Ensure you apply products (preferably) early in the morning or in the evening. When mixing with other products, it is recommended to conduct a small-scale trial in order to check the compatibility of the mixture before operating on a larger scale and spraying.

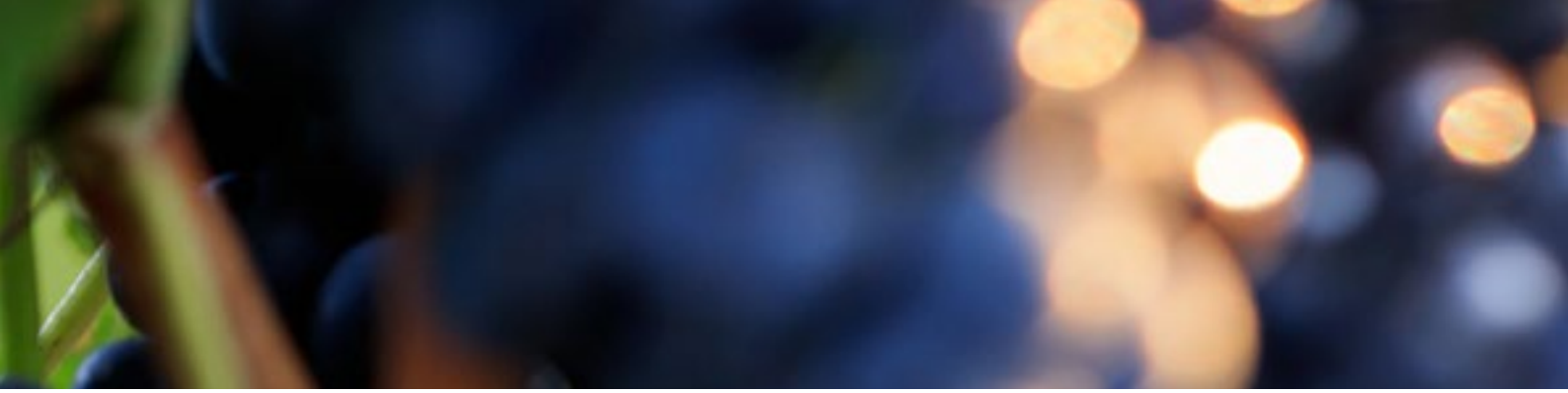
Water solubles

- Continuous agitation or stirring will speed up dissolution.
- The time required to dissolve the product, however, will also depend on the quality and temperature of the spraying water. Poor quality water may affect solubility.
- To get the best results from the products:

1. Fill the tank with water to at least two-thirds of its capacity.
2. Add the product taking care not to exceed the maximum recommended concentration.
3. Maintain stirring or agitation throughout the entire operation.
4. Fill the remainder of the tank with water.
5. Check that the product has dissolved completely before using the solution.
6. The use of filters is recommended, as generally advised for most solid fertilizers when used in solution.

- Do not apply products when temperature exceeds 30°C - apply products preferably early in the morning or in the evening.
- Do not mix sulfates with materials containing calcium.
- When mixing with other products it is recommended to conduct a small-scale trial to check the compatibility of the mixture before operating on a larger scale.
- Store products in dry conditions, avoiding extreme heat or cold.

Always respect and comply with local legislation and regulation regarding the use of fertilizer products.



SUSTAINABLE CROP NUTRITION FOR AGRICULTURE

For over 100 years Tessenderlo Kerley International has demonstrated its commitment to nurturing crop life through innovation, research and the development of novel fertilizers for a more sustainable agriculture. Our diverse product portfolio addresses the challenges of modern agriculture by delivering essential nutrients in forms that protect soil health and optimize nutrient use efficiency.

We provide an extensive range of both liquid and solid/soluble fertilizers

KTS® CaTs®

HIGH-PERFORMANCE LIQUIDS

SoluPotasse® Solucros®

HIGH QUALITY SOLID/SOLUBLES

MagThio® Thio-Sul®

K-Leaf® GranuPotasse®

Our experts are familiar with your region and crops.
Their support includes:

- Agronomic advice
- Providing technical information
- Carrying out field studies that are specific to your issues
- Providing application and storage tips

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