APPLY IN THE ROW

POTASSIUM AND SULFUR

0-0-23-8S

FERTILIZER SOLUTION

K-Row 23®

Potassium (as K_2O)	**23%**
Total Sulfur (S)	**8%**
Density: pounds per gallon at 68°F	**11.5**
Volume: gallons per ton	**174**

GENERAL INFORMATION

K-Row 23 is a chloride free, clear to slightly yellow liquid solution containing 23% K_2O and 8 % plant available sulfur. Each gallon of K-Row 23 contains approximately 2.6 pounds of potassium (K_2O) and approximatley1.0 pounds of sulfur (S). K-Row 23 is a seed safe product developed by Tessenderlo Kerley, Inc. for starter fertilizer applications (See Application & Use Recommendations).

University tests have shown that K-Row 23 is seed safe when used at recommended rates. In fact, it was one of the safest materials tested in germination trials.

K-Row 23 can be blended in any ratio with 10-34-0 or 11-37-0 to provide potassium and sulfur, critical nutrients, especially in minimum or no-tillage conditions. Blends with UAN solution should be jar tested before making large quantities. UAN blends should contain enough water to equal the lesser amount of one of these products to reduce crystal formation. K-Row 23 can be acidified to a pH of 6.0 to form a stable acidic fertilizer for high pH soils.

Unless otherwise noted, all suggested uses are for K-Row 23 only. For additional products or increased rates of application, test plots should be conducted before planting large acreage.

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 potassium and sulfur needed for optimum crop production. The rate of each application of K-Row 23 should be made based on a soil test and/or plant tissue analysis for potassium and sulfur, and on the recommendations of a Certified Crop Advisor, Pest Control Advisor or authorized K-Row 23 distributor.

TESSENDERLO Kerley

K-Row 23®

EST. 1919

ADD POTASSIUM AND SULFUR

IN THE ROW

APPLICATION & USE RECOMMENDATIONS

See Application Precautions on Page 5 Before Applying

STARTER FERTILIZER IN-FURROW

Be sure to follow established recommendations for crop, soil type and moisture conditions in your area. Excessive amounts of fertilizer can damage seed germination.

Corn: For Pop-up or in-furrow placement, K-Row 23 can be applied along with ammonium polyphosphate (APP) in any combination.

In-furrow application of blends of K-Row 23 with 10-34-0 should not exceed:

- 80 pounds per acre (7.0 gallons per acre) of mixed product in-furrow for heavy clay soils with no more than 5 gallons per acre of APP.
- 40 pounds per acre (3.5 gallons per acre) of mixed product in-furrow for sandy soils
- 40 pounds per acre (3.5 gallons per acre) of mixed product when soil conditions are dry.
- K-Row 23 weighs 11.5 pounds per gallon, approximately the same as 10-34-0 per gallon. If other fertilizers are added to the suggested rates above, then a test trial should be done before making large applications.
- By itself, apply 1 to 5 gallons per acre of K-Row 23 with the seed. In sandy or dry soil, reduce the rate and apply 0.5 to 2.5 gallons per acre.

Wheat: Apply 1 to 3 gallons per acre by itself or in combination with APP.

Follow established rates for N + K_2O with the seed for your area and/or soil type.

When using 11-37-0, adjust the amount according to the above suggested rates.

Soybeans (Irrigated): Based on 30" rows, apply 2-4 gallons per acre of K-Row 23 in-furrow, by itself. Irrigate after application to ensure good moisture for germination.

Soybeans (Dry land): Apply 1-2 gallons per acre in-furrow with good moisture.

STARTER FERTILIZER (2"x 2" OR 2"x 0")

Corn: Apply 1 to 8 gallons per acre of K-Row 23 with or without APP in a 2" x 2" (2 inches to the side of the seed row and 2 inches below) or 2" x 0" (2 inches to the side of the seed row on the soil surface) placement. For sandy or dry soils reduce rate by 50% when moisture is limiting.

Soybeans: Apply 1 to 6 gallons per acre of K-Row 23 in a 2" x 2" (2 inches to the side of the seed row and 2 inches below) or 2" x 0" (2 inches to the side of the seed row on the soil surface) placement. In sandy or dry soil, reduce the rate and apply 0.5 to 2.5 gallons per acre.

EXAMPLES OF K-ROW 23 STARTER FERTILIZER BLENDS

See Blending Guidelines on Page 4 Before Blending

BLEND	PRODUCTS	LBS / TON
6-21-6-2S	10-34-0	1235
	K-Row 23	522
	Water	243
7-25-6-2S	10-34-0	1470
	K-Row 23	522
	Water	8
5-17-11-4S	10-34-0	1000
	K-Row 23	1000
10-13-5-1.75S	UAN 32	387
	10-34-0	765
	K-Row 23	435
	Water	413

Always do a jar test when mixing unfamiliar blends.

FERTIGATION

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

Before injecting K-Row 23 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 K-Row 23 should be made in the middle third or second half of an irrigation set.

- The injection of K-Row 23 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 K-Row 23 should be done with a fertilizer injection pump and over a 1 to 4 hour time period in the middle third or second half on an irrigation set.
- Rapid injection of K-Row 23 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."

SPRINKLER/CENTER PIVOT

Trees (Under): 6 to 9 gallons per acre per application every 10 to 14 days based on crop requirements.

Trees (Overhead): 4 to 5 gallons per acre every 10 to 14 days based on crop requirements.

Vines: 4 to 5 gallons per acre every 10 to 14 days based on crop requirements.

Vegetable and Row Crops: Beginning at the 3rd - 4th leaf stage, apply 1 to 7 gallons per acre every 7 to 10 days based on crop requirements.

After injection, allow enough irrigation time (at least 60 minutes) to rinse the plants of any residual fertilizer.

DRIP IRRIGATION

Young Trees: 3 to 6 gallons per acre during the season, starting at full leaf; apply once every 2 to 4 weeks.

Mature Trees: 5 to 12 gallons per acre, starting at full leaf; apply once every 2 to 4 weeks.

Grapes: Application of K-Row 23 can be made any time up to veraison and post-harvest.

Young vines: 3 to 6 gallons per acre, no more than once every 2 to 4 weeks.

Mature vines: 5 to 12 gallons per acre as required according to tissue analysis, no more than once every 2 weeks, as needed.

Vegetable and Row Crops: 3 to 6 gallons per acre, once every 10 days, no more than 3 times per month.

Strawberries: 3 to 6 gallons per acre once every 10 days after plants are well established, no more than 3 times per month.

Blueberries: 3 to 6 gallons per acre once every 10 days after plants are well established, no more than 3 times per month.

Caneberries: 3 to 6 gallons per acre once every 10 days after plants are well established, no more than 3 times per month.

MICRO-SPRINKLER (FAN JET)

Young Trees: 3 to 6 gallons per acre, once every 3 to 4 weeks.

Mature Trees: 5 to 18 gallons per acre, once every 2 to 4 weeks.

Young Vines: 3 to 6 gallons per acre, once every 2 to 4 weeks, starting at full leaf.

Mature Vines: 5 to 12 gallons per acre as required according to tissue analysis, once every 2 to 4 weeks, starting at full leaf.

OTHER APPLICATIONS

K-Row 23 can be soil injected or deep banded by itself or with nitrogen and phosphorus to supply crops with N, P, K and S requirements for the season. Deep banding can improve nutrient use efficiency by reducing nutrient loss due to erosion and soil fixation.

K-Row 23 can also be broadcast sprayed on soil surface or surface banded between rows to help meet potassium and sulfur requirements. Follow soil and tissue test recommendations to apply the proper amount of potassium and sulfur.

A SEED-SAFE AND EFFICIENT POTASSIUM AND SULFUR SOLUTION

BLENDING GUIDELINES

K-Row 23 is compatible with liquid urea and ammonium polyphosphate (APP) solutions in any ratio.

When blending K-Row 23 and UAN solution, water should be added to the blend to equal the weight of K-Row 23 or UAN in the final mix. **The blending order should be:** K-Row 23, then water, followed by UAN. Blends with UAN solution should be jar tested before making large quantities.

In cold weather, the potassium in K-Row 23 reacts with the nitrate in UAN to form potassium nitrate crystals. Adding water or heat will bring the crystals back into solution.

Avoid sparging air into K-Row 23 or a K-Row 23 blend.

When mixing pesticides with K-Row 23, and other fertilizers, the blend sequence should be as follows: water, then pesticide, followed by K-Row 23 and/or other fertilizer. Always make sure that combinations with pesticides are compatible by jar testing all the products to be tank mixed.

Micronutrient blends should be jar tested first before mixing with K-Row 23. In most situations, micronutrients should be fully chelated.

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 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 K-Row 23 if the pH of the soil is below 6.0.

TESSENDERLO Kerley
K-Row 23
EST. 1919

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

See SDS for additional information on

safety and handling at: **cropvitality.com/krow23**

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 K-Row 23 to foliage of crops sensitive (foliar burn) to sulfur.
- 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 K-Row 23 with knife injectors or other types of fertilizer injecting equipment that may cause root pruning.
- DO NOT apply K-Row 23 foliar with crop oil sprays. Allow at least 14 days before or after an application of crop oil before applying K-Row 23 as a foliar.
- DO NOT apply K-Row 23 while chlorinating irrigation system. K-Row 23 will neutralize chlorine.
- DO NOT mix K-Row 23 with acid or acidic fertilizers below a pH of 6.0.
- Avoid injecting acids into irrigation water while injecting K-Row 23. If water pH is too low or injection point to close, K-Row 23 could decompose and potentially plug drip system.
- DO NOT use high-pressure sprays (greater than 60 psi) when applying K-Row 23 over the top of a crop.
- Recommendations are for K-Row 23 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 K-Row 23 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 K-Row 23 in pop-up fertilizer when soil moisture is limited (only when there is adequate moisture for good germination), soil salinity is above an electrical conductivity of 1.0 or when irrigation is delayed such that germination may be affected.
- Fertigation application of K-Row 23 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 K-Row 23 to the crop
    - K-Row 23 rates are higher than suggested
    - Ample irrigation water is not applied immediately before and after the injection of K-Row 23
- 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 K-Row 23 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

K-Row 23
0-0-23-8S

PLANT NUTRIENT CONTENT WEIGHT %	
Potassium (as K_2O)	23
Total Sulfur (S)	8
TYPICAL PROPERTIES	
Specific Gravity	1.38
pH	8.0 - 9.0
Appearance	Clear, Colorless to Slightly Yellow
Salt-Out Temperature	-4°F
Actual Salt Index	46
FORMULATION AND APPLICATION FACTORS, 68°F	
Density: pounds per gallon	11.5
Volume: gallons per ton	174
Pounds of Potassium (as K_2O) per gallon	2.6
Pounds of Sulfur per gallon	0.92

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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