

**MONOPOTASSIUM PHOSPHATE AS A FERTILIZER
COMPONENT FOR LIQUID & SUSPENSION FERTILIZERS
(AMMONIATING MKP SOLUTIONS)**

Page 1 of 5

THE COMPOUND

Monopotassium Phosphate (MKP)(KH_2PO_4) is a soluble, high nutrient value (0-52-34) compound, which is essentially chloride free. It is a white crystalline solid, slightly deliquescent, but with very good handling qualities. Detailed physical properties are described on the attached data sheets.

MKP is an acidic salt with a pH of 4.6 for a 1% solution, dropping to 4.2 for a saturated solution at 23°C. As such, it is an excellent buffer for basic components such as ammonia.

The natural solubility of MKP is only moderate and is temperature dependent. This limits the use of MKP in clear liquids in its pure form, but has relatively little effect on the formulation of high nutrients, chloride free suspensions.

MKP IN CLEAR LIQUID FERTILIZERS

There is a simple way to improve the solubility of MKP to make high nutrient, clear liquid fertilizers, chloride-free, of higher than conventional nutrient value. This is done by ammoniating saturated solutions of MKP to pH ranges of 7.2 to 7.6 and re-saturating the solution with MKP. Repetition of this procedure can produce stable clear liquid fertilizers with nutrient values as high as (3.6 - 27.4 - 19.6) with ratios of 1:7:5 (being important for starter fertilizers).

A highly important feature of these liquids and this process is that these formulations,

while being made at temperatures as high as 52°C (126°F) during ammoniation, remain stable with no solids precipitation when cooled as low as 5°C (41°F).

By this method, the solubility of MKP at 75°F was increased from 249 pounds per 1,000 pounds of water, to 1,390 pounds per 1,000 pounds of water (plus 39 pounds of ammonia).

This is a major advance in the concentration of K and P in clear liquid.

MKP IN SUSPENSION FERTILIZERS

Here again advantage can be taken of the MKP-Ammonia affinity.

Tests have shown that a stable suspension can be made grading 7.3 - 36.2 - 24.3 with a ratio of 1:5:3 by dissolving MKP in (24-0-0) aqua ammonia to concentration and adding extra MKP to bring it up to the suspension analysis.

The addition of 1.5 - 2% attapulgit to the above with the final mixing produces a stable long term suspension.

By this method, a high-nutrient, stable suspension, chloride free, is produced which could be made either at the blenders' facility or at the application site. The total nutrient content is over 67% which is some 30% higher than most suspensions listed in the 1985 Fluid Fertilizer Manual.

(See Page 2)

AGRONOMIC ADVANTAGES OF MKP

MKP in the ammoniated form was tested in 1986 as a starter fertilizer on corn, in on-seed, and 2 x 2 band tests. (Michigan State University, 1986)

It is well within the capabilities of most liquid and slurry blenders to duplicate and even improve on the results obtained to date.

No deleterious effects were seen on plant populations, dry plant weight increased 29-31% over control, and bushel yield was 97-105% of control, exceeded only by 10-34-0 at 101.5% of control.

Similar testing was done on soybeans, where ammoniated MKP showed the least deleterious effect of all starter fertilizers on plant population and along with 10-34-0, the best bushel per acre yield at 109% of control (University of Illinois, 1986).

In confirmatory tests on corn at Michigan State University, ammoniated MKP blended with Urea to give 6-20-12.5 lb/acre dosage was tested against 10-34-9 plus 0-0-62 KCL in the same 6-20-12.5 lb/acre dosage. Results gave 8% better yield on 2 x 2 placement, 1.8% poorer yield in on-seed placement. Dry plant weight was increased by 20-50% over the (10-34-0) (0-0-62) blend, a significant advantage in silage production.

SUMMARY AND RECOMMENDATIONS

From the foregoing, it can be seen that MKP, when ammoniated, is capable of producing attractive high quality clear fluid and suspensions for the chloride-free markets.

The high nutrient level of MKP reduces transport and handling costs of non-contributing elements.

Lidochem, Inc.
Specialty Fertilizer Division
20 Village Court, Hazlet, NJ 07730
Phone#(908) 888-8000 Fax#(908) 264-2751

MONOPOTASSIUM PHOSPHATE (MKP)

*The Potential for Marketing MKP as a Chloride-Free
Source of Potassium and Phosphorus for Specific
Agricultural Fertilizer Requirements*

The Chemical

Monopotassium Phosphate (KH_2PO_4) is a highly concentrated plant food containing 34.4% K_2O and 52.0% P_2O_5 . It is a free flowing-material, and non-hygroscopic, even at relatively high humidities, and has relatively good solubility, (20 gms/100 gms sat. sol. @ 20°C). It offers good possibilities as a material for liquid and suspension fertilizers.

Solubility & Salting Out Properties

Solubility in pounds per 1000 pounds of water at various temperatures.

TEMPERATURE**SOLUBILITY**

32°F - 0°C	142
40°F - 4°C	158
50°F - 10°C	178
60°F - 16°C	202
70°F - 21°C	229
80°F - 27°C	255

As can be seen from the above, the solubility gradient varies directly with the temperature, and fairly steeply, so that "salting out", or crystallization from a saturated solution can be significant if temperature is not controlled.

Nutrient Equivalents

Monopotassium Phosphate (MKP) has a nutrient value formula of (0-52-34), meaning 0 units of nitrogen, 52 units of P_2O_5 , and 34 units of K_2O , per 100 units of MKP.

Saturated Solution Plant Food Contents at Various Temperatures.

TEMPERATURE **K_2O %** **P_2O_5 %**

32°F - 0°C	4.3	6.4
40°F - 4°C	4.7	7.0
50°F - 10°C	5.2	7.7
60°F - 16°C	5.9	8.6
70°F - 21°C	6.4	9.6
80°F - 27°C	7.0	10.5

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Solubilities in pounds per 1000 lbs of water at different temperatures of potash salts used or formed in the formulation of fluid fertilizers.

Temperature F°	Potassium Nitrate	Potassium Chloride	Potassium Sulfate	Monopotassium Phosphate	Dipotassium Phosphate
---lbs---					
32	130	280	74	142	1328
35	143	285			
40	166	293		158	
45	188	302			
50	210	310	92	178	1488
55	240	318			
60	271	327	115	202	1513
65	301	335			
70	335	343		229	1605
75	374	352		249	1677
80	403	360		255	1724
85	452	368	128	274	1788
	SW	SW	CH	CH	CH

CH is data from Chemical Handbook

SW is data from Southwest Potash Co.

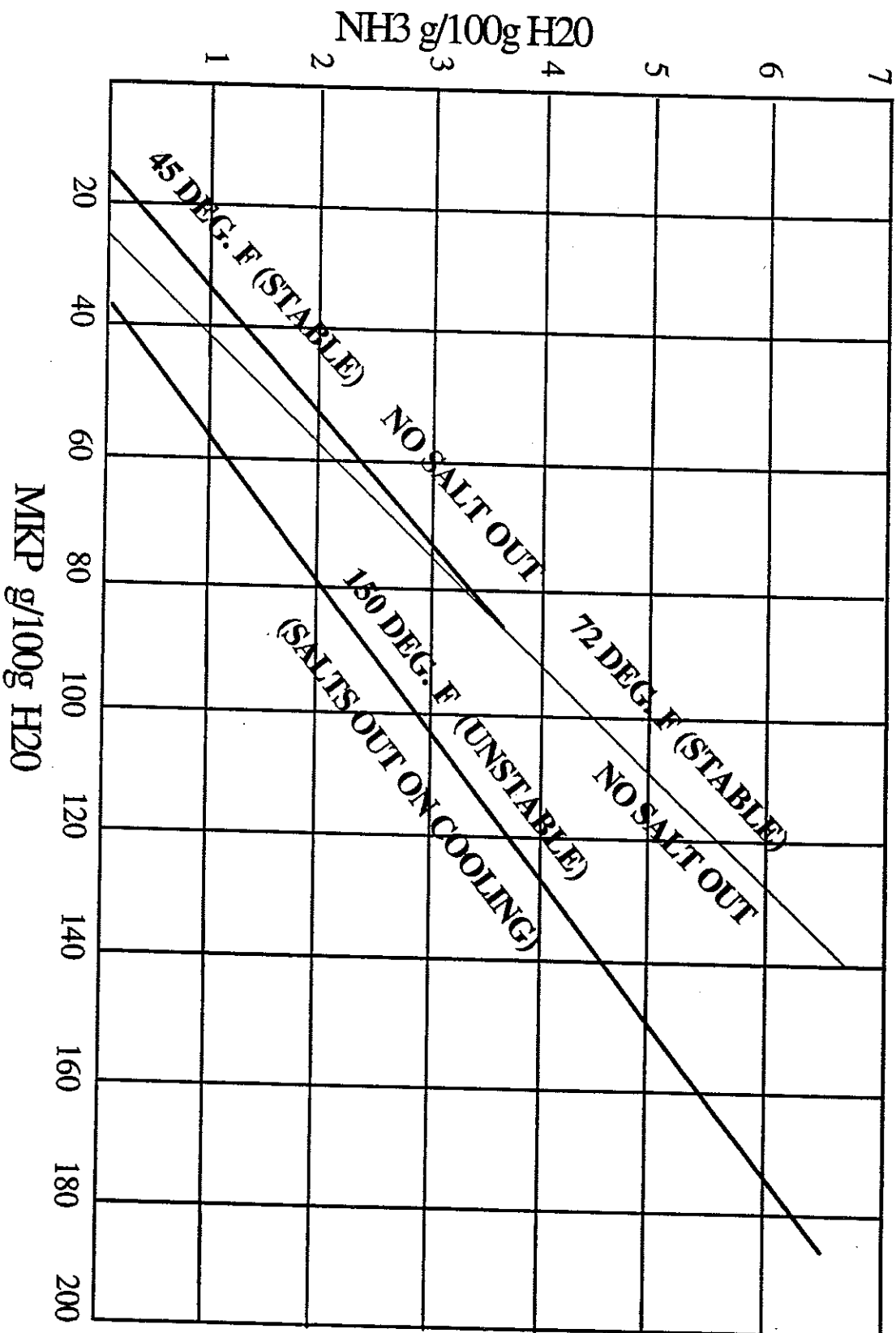
Percent of plant foods is saturated solutions at different temperatures for potash salts used or formed in the formulation of fluid fertilizers.

Temperature F°	Potassium Nitrate		Potassium Chloride		Potassium Sulfate		Monopotassium Phosphate		Dipotassium Phosphate	
	K ₂ O	N	K ₂ O	Cl ₂	K ₂ O	S	K ₂ O	P ₂ O ₅	K ₂ O	P ₂ O ₅
---%---										
32	5.4	1.6	13.8	10.4	3.7	1.3	4.3	6.4	30.8	23.3
35	5.8	1.7	14.0	10.5						
40	6.6	2.0	14.3	10.8			4.7	7.0		
45	7.4	2.2	14.7	11.0						
50	8.1	2.4	14.9	11.3	4.6	1.6	5.2	7.7	32.3	24.1
55	9.0	2.7	15.2	11.5						
60	9.9	3.0	15.6	11.7	5.6	1.9	5.9	8.6	32.6	24.5
65	10.8	3.2	15.9	11.9						
70	11.7	3.5	16.1	12.1			6.4	9.6	33.3	25.1
75	12.7	3.8	16.4	12.4			6.9	10.2	33.9	25.6
80	13.4	4.0	16.7	12.6			7.0	10.5	34.2	25.8
85	14.5	4.3	17.0	12.8	6.1	2.1	7.4	11.0	34.7	26.1

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 Specialty Fertilizer Division
 20 Village Court, Hazlet, NJ 07730
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SYSTEM - SOLUBILITY KH₂PO₄ - NH₃ - H₂O

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WHY USE ROTEM'S MONOPOTASSIUM PHOSPHATE?

Reason #1: Low Salt Content

The tendency of a fertilizer product to injure the seed or plant is estimated in the laboratory by testing the salt index. The higher the salt index, the higher the tendency of the product to cause injury to seed germination. Most starter fertilizer products on the market that are being recommended for placement on the seed have a salt index in the range of 40-50.

An excessively high concentration of soluble salts in the soil solution may develop an osmotic pressure of the solution exceeding that of the plant sap and cause dehydration, permanent injury, or even death of the plant. The lower the salt index, the lesser the risk of causing crop injury in periods of extreme drought or with localized placement of fertilizers.

In a nutshell, the lower the salt index, the lower the chance of burn potential. This will result in higher yields for the growers to whom you supply fertilizers.

Rotem-Amfert-Negev Fertilizers, Ltd. (Rotem), Israel is a new producer of Monopotassium Phosphate (MKP), who produces MKP via a patented and inexpensive process. **Rotem's MKP** has a salt index of 8.4 and, as such, **has the lowest salt index** of any fertilizer raw material. By formulating your water soluble and specialty liquid fertilizers with Rotem's MKP, you can significantly (and often, completely) **eliminate the chloride (salt) content of your fertilizer.**

When you choose Rotem's Monopotassium Phosphate as your source of "P" and "K" you choose to serve your customers better - by reducing the burn potential of your fertilizer and increasing the quality and volume of their yields.

For more information, please contact our sales office at the phone or facsimile numbers listed below.

Lidochem, Inc.
Specialty Fertilizer Division
20 Village Court, Hazlet, NJ 07730
Phone#: (908) 888-8000 Fax#: (908) 264-2751

Facts about...**UREA PHOSPHATE**

- *Urea Phosphate does not react with Calcium Nitrate so they can be used in the same solution. The Phosphate in Monoammonium Phosphate reacts with Calcium and forms insoluble phosphates.*
- Urea Phosphate prevents blocking of irrigation pipes and nozzles and disinfects the irrigation system.
- Urea Phosphate lowers the pH of solutions and, as such, improves the solubility and availability of some plant nutrients, i.e. phosphorus and micro-nutrients.
- Urea Phosphate's loss of Nitrogen by volatilization and leaching is remarkably low (0.7%) compared with Urea (21%).
- Urea Phosphate is an excellent source of water soluble Nitrogen and Phosphate (18-44-0) in circumstances where high pH or hard water is a problem.
- Urea Phosphate, in general, provides improved nutrient uptake and balance in the crop and is ideal to use when shorter growing time is of importance, especially in soil conditions with high pH.
- Urea Phosphate does not release ammonia as with some other Nitrogen sources (Urea, for example) because of the phosphoric acid in the molecules.
- Urea Phosphate will provide higher yields than Monoammonium Phosphate in hard water conditions.
- Urea Phosphate does not damage seedlings and young plants when used in right dosage.
- Urea Phosphate, when used in some lawn fertilizers, is very efficient as a moss killer by lowering the pH of nutrient solutions.
- Urea Phosphate hampers algae growth.

*Facts about...***MONOPOTASSIUM PHOSPHATE**

- Monopotassium Phosphate is the most concentrated fertilizer (52% P_2O_5 and 34% K_2O) available and contains 100% of plant assimilable nutrients ($H_2PO_4^-$ and K^+)
- Monopotassium Phosphate is fully water soluble, virtually free of impurities and residual contaminants.
- Monopotassium Phosphate is cadmium free and very low in chlorine and sodium which makes it ideal for fertigation, especially on soil-less culture with recycled water.
- Monopotassium Phosphate has the lowest salt index among soluble fertilizing salts (8.4) which makes it ideal for foliar fertilization, and thereby reduces your potential to burn seed, seedlings or foliage.
- Monopotassium Phosphate is fully water soluble, non-hygroscopic, free-flowing with minimal dust.
- Monopotassium Phosphate is the most concentrated fertilizer raw material available enabling the fertilizer blender to produce nutrient rich fertilizers such as 20-20-20, without leaving out any micro-nutrients.
- Monopotassium Phosphate is a non-regulated raw material allowing the liquid fertilizer manufacturer to eliminate the hazard and cost of storing, transporting and handling a corrosive material such as Phosphoric Acid.
- Monopotassium Phosphate is a specialty fertilizer raw material for intensive agriculture and horticulture for vegetables, fruits and flowers in greenhouses and open fields.
- Monopotassium Phosphate yields a finished fertilizer that is less hygroscopic and more free flowing than fertilizers produced with Monoammonium Phosphate as the main ingredient.
- Monopotassium Phosphate is not hygroscopic and, if used as a replacement for Monoammonium Phosphate, will flow more easily through "form, fill and seal" equipment.
- Monopotassium Phosphate is now economically feasible to replace Monoammonium Phosphate and Potassium Nitrate in water soluble fertilizers and Phosphoric Acid in liquids.
- Rotem Fertilizer's Research and Development Laboratories have developed a proprietary process which allows Monopotassium Phosphate production to be derived from 2 basic raw materials - Phosphate rock from sedimentary deposits in the Negev Desert and Potassium Chloride. As a result, Rotem can offer Monopotassium Phosphate that meets the highest standard of purity and quality at prices normally associated with Monoammonium Phosphate.

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Fax#(908) 264-2751

Raw Material Now In Stock
in New Jersey, Illinois and California

Phosphates

Ammonium Phosphates

Diammonium Phosphate
Monoammonium Phosphate
Urea Phosphate
Phosphoric Acid

Potassium Phosphates

Dipotassium Phosphate
Monopotassium Phosphate
Tetrapotassium Phosphate

Calcium Phosphates

Dicalcium Phosphate
Monocalcium Phosphate
Tricalcium Phosphate

Sodium Phosphates

Sodium Tripolyphosphate
Tetrasodium Pyrophosphate

Chelates and Micronutrients

Chelating Agents

Disodium EDTA, Powder
(Similar to Versene ® Na₂)
EDTA, Powder
(Similar to Versene ® Acid)
Tetrasodium EDTA, Powder
(Similar to Versene ® 220)
N-P-K Compatible Glucoheptonates

Micronutrients

Copper EDTA, Powder 14% Cu
Iron EDTA, Powder 13% Fe
Manganese EDTA, Powder 13% Mn
Zinc EDTA, Powder 14% Zn

Sulfates

Copper Sulfate, 25% Cu
Magnesium Sulfate, 16% MgO

Manganese Sulfate, 31% Mn
Zinc Sulfate, Monohydrate

Nitrates

Calcium Nitrate
Magnesium Nitrate

Ammonium Nitrate
Potassium Nitrate

Miscellaneous

Citric Acid
Alkyl Aryl Sulfonic Acid
Calcium Carbonate
Urea

Sulfate of Potash
Potassium Carbonate
Sodium Dodecylbenzene Sulfonate
(Similar to Ultra-Wet K ®)

LIDOCEM, INC.
20 Village Court, Hazlet, NJ 07730
Phone#(908)888-8000 Fax#(908)264-2751

SOLUBILITY
OF
SULFATE OF POTASH

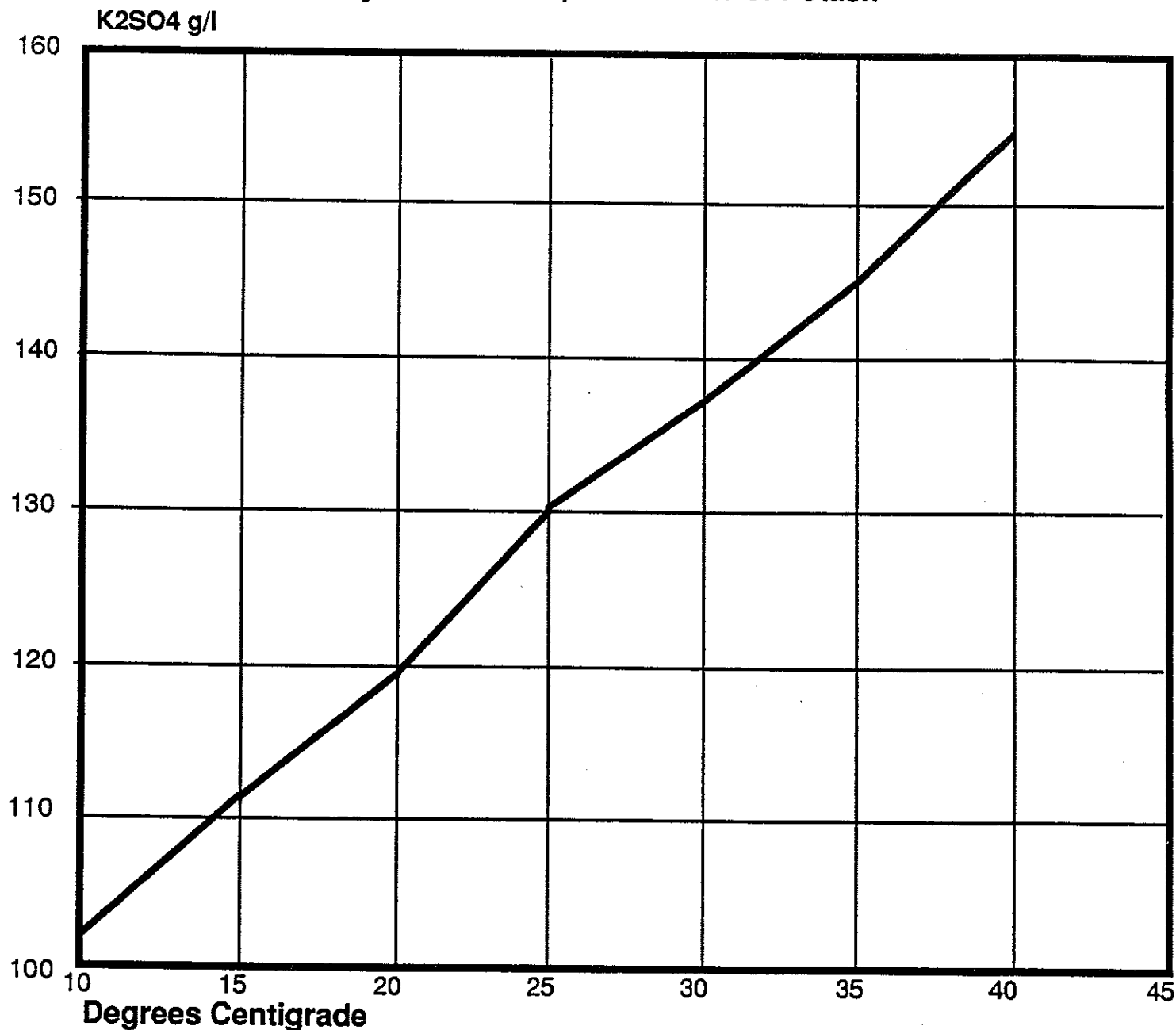
	<u>Grams K₂O/Liter</u>	<u>Grams K₂SO₄/Liter</u>
At:		
10° C	54.8	101.4
15° C	59.9	110.8
20° C	64.6	119.5
25° C	70.3	129.9
30° C	74.2	137.2
35° C	78.1	144.5
40° C	83.3	154.1

POTENTIAL BASICITY OF FERTILIZER RAW MATERIALS

(Equivalent Acidity (-) or basicity (+) expressed as pound of CaCO_3 /1000 lb of material:)

Urea	- 840
Ammonium Nitrate	- 630
Ammonium Sulfate	- 1120
Monoammonium Phosphate 12-62	- 650
Diammonium Phosphate 21-54	- 740
Monopotassium Phosphate 51-34	- 340
Potassium nitrate	+ 260
Calcium Nitrate	+ 200
Potassium Chloride	0
Potassium Sulfate	0
Magnesium Sulfate	0

Solubility of Lidochem, Inc. Sulfate of Potash



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UREA PHOSPHATE IN CALCIUM NITRATE SOLUTIONS

Are you delivering any Calcium Nitrate Solutions to your growers and farmers? Many fertilizer dealers are because of Calcium's value to plants during the growing cycle. If you are one of these suppliers you should know about Urea Phosphate.

Urea Phosphate is a water soluble source of Nitrogen and Phosphate (18-44-0). It is very similar to the Monoammonium Phosphate and Diammonium Phosphate but has the advantage of delivering a non-volatile form of Nitrogen (see enclosed bulletin for other benefits).

More importantly, Urea Phosphate is stable in Calcium Nitrate solutions. The Phosphate in Urea Phosphate will not "fall out" when blended with Calcium Nitrate in the same solution. You now can deliver more nutrients to your growers - on the same truck - netting you a higher profit and more efficient use of your equipment. You Should also know that Urea Phosphate is not considered a hazardous material by the D.O.T.. Urea Phosphate eliminates the need to use corrosive materials for your source of "P" (such as Phosphoric Acid) and minimizes the potential hazards and liabilities associated with corrosive materials.

Should you be interested in knowing more about Urea Phosphate and its use in Calcium Nitrate solutions, please contact your Lidochem sales representative at the numbers listed below. In any event someone from our office will contact you to answer any questions you may have.

CALCIUM NITRATE + UREA PHOSPHATE

Enclosed, please find some results of the experiments done with Calcium Nitrate and Urea Phosphate or Urea Phosphate based fertilizers. I hope you can make use of the results, but I would like to stress the importance of the last paragraph of this page.

As you can see, with 30% total salt concentration, all the ratios Calcium Nitrate to Urea Phosphate can be done without precipitation. The same is also true with lower total salt concentration. When Calcium Nitrate is added to 30% of the original mass of Urea Phosphate solution (\Rightarrow Calcium Nitrate concentration 23%) without precipitation but if more is added, precipitation occurs. In this "limit concentration" the water content is 54% and total salt concentration is 46%.

With N-P-K mixture 20-20-20 based on Urea Phosphate, if the total salt concentration is 30%, all 20-20-20- to Calcium Nitrate ratios can be mixed. By adding Calcium Nitrate to 30% 20-20-20 solution, 90% of the original mass of 20-20-20 solution (\Rightarrow Calcium Nitrate concentration 48%) can be added, precipitation occurs. In this "limit concentration" the water content is 36% and total salt concentration is 64%.

30% N-P-K mixture 14-30-10 (based on Urea Phosphate), only very small amounts of Calcium Nitrate could be added (max. 0.2% Calcium Nitrate \Rightarrow 29.9%) 14-30-10 solution still was clear liquid, but already 0.3% Calcium Nitrate caused precipitation.

According to these results, when a new formulas containing both Urea Phosphate or Urea Phosphate based fertilizer and Calcium Nitrate is studied, careful tests must be done to avoid problems with precipitation. There is clearly possibilities for new concentrated formulas where both N, P, K and Ca-concentration is remarkable, both each of these must be specified separately.

Our Research and Development Department will continue to work with Urea Phosphate and I will share their results with you. Should you have any questions please feel free to contact me.

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Specialty Fertilizer Division
20 Village Court, Hazlet, NJ 07730
Phone#(908) 888-8000 Fax#(908) 264-2751

**CALCIUM NITRATE & UREA PHOSPHATE
(30% SOLUTION)**

<u>UREA PHOSPHATE</u> (%)	<u>CALCIUM NITRATE</u> (%)	<u>WATER</u> (%)	
3	27	70	Liquid
9	21	70	Liquid
12	18	70	Liquid
15	15	70	Liquid
18	12	70	Liquid
21	9	70	Liquid
27	3	70	Liquid

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CALCIUM NITRATE & 20-20-20+TE **(30% SOLUTION)**

RECIPE OF 20-20-20+TE:

	<u>KG/T</u>
POTASSIUM NITRATE	370.5
UREA PHOSPHATE	359.9
UREA	187.1
MONOPOTASSIUM SULFATE	81.5
TRACE ELEMENTS	1

<u>UREA PHOSPHATE</u> <u>(%)</u>	<u>CALCIUM NITRATE</u> <u>(%)</u>	<u>WATER</u> <u>(%)</u>	
3	27	70	Liquid
9	21	70	Liquid
12	18	70	Liquid
15	15	70	Liquid
18	12	70	Liquid
21	9	70	Liquid
27	3	70	Liquid

CALCIUM NITRATE & 14-30-10+TE (30% SOLUTION)

RECIPE OF 14-30-10+TE:

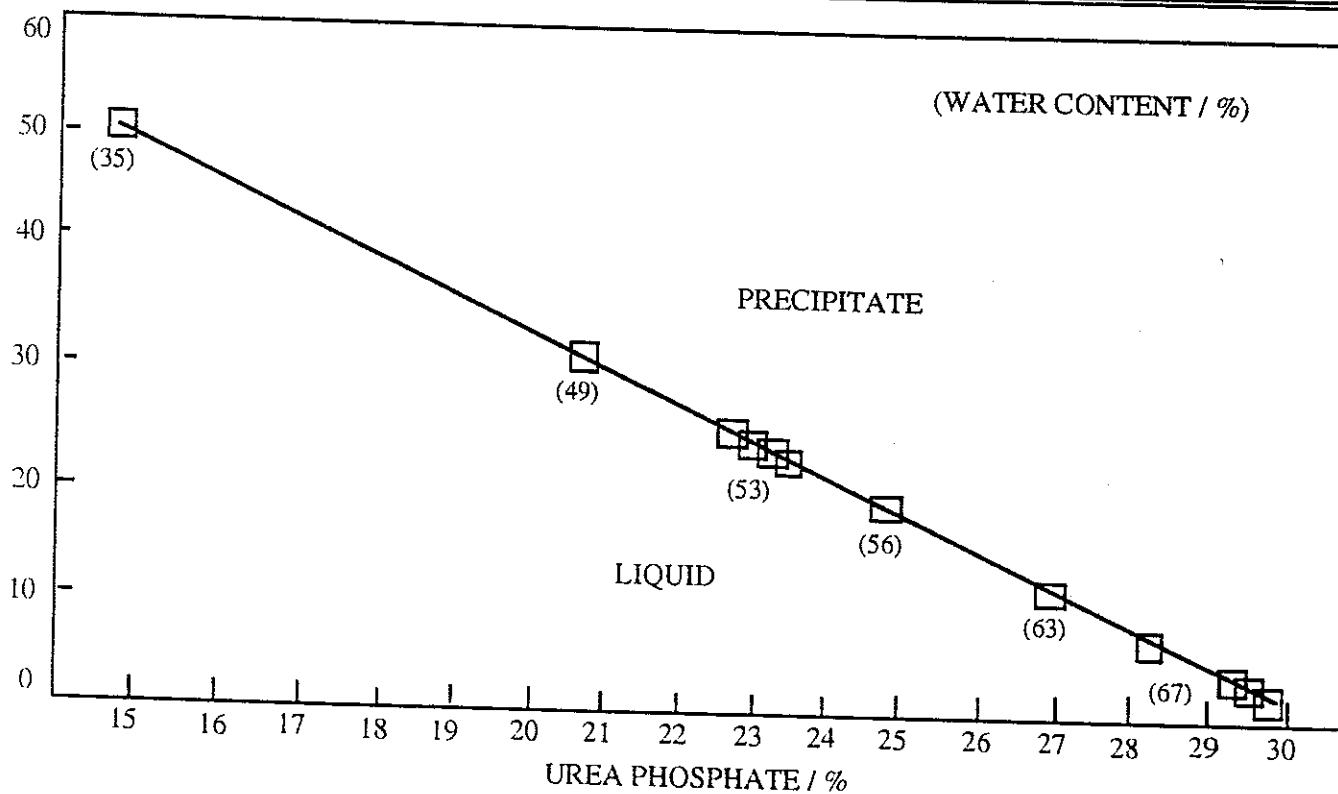
	<u>KG/T</u>
UREA PHOSPHATE	681.8
POTASSIUM SULFATE	199.2
AMMONIUM SULFATE	118
TRACE ELEMENTS	1

<u>14-30-10</u> (%)	<u>CALCIUM NITRATE</u> (%)	<u>WATER</u> (%)	
3	27	70	Precipitate
9	21	70	Precipitate
12	18	70	Precipitate
15	15	70	Precipitate
18	12	70	Precipitate
21	9	70	Precipitate
27	3	70	Precipitate

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30% UREA PHOSPHATE SOLUTION + CALCIUM NITRATE

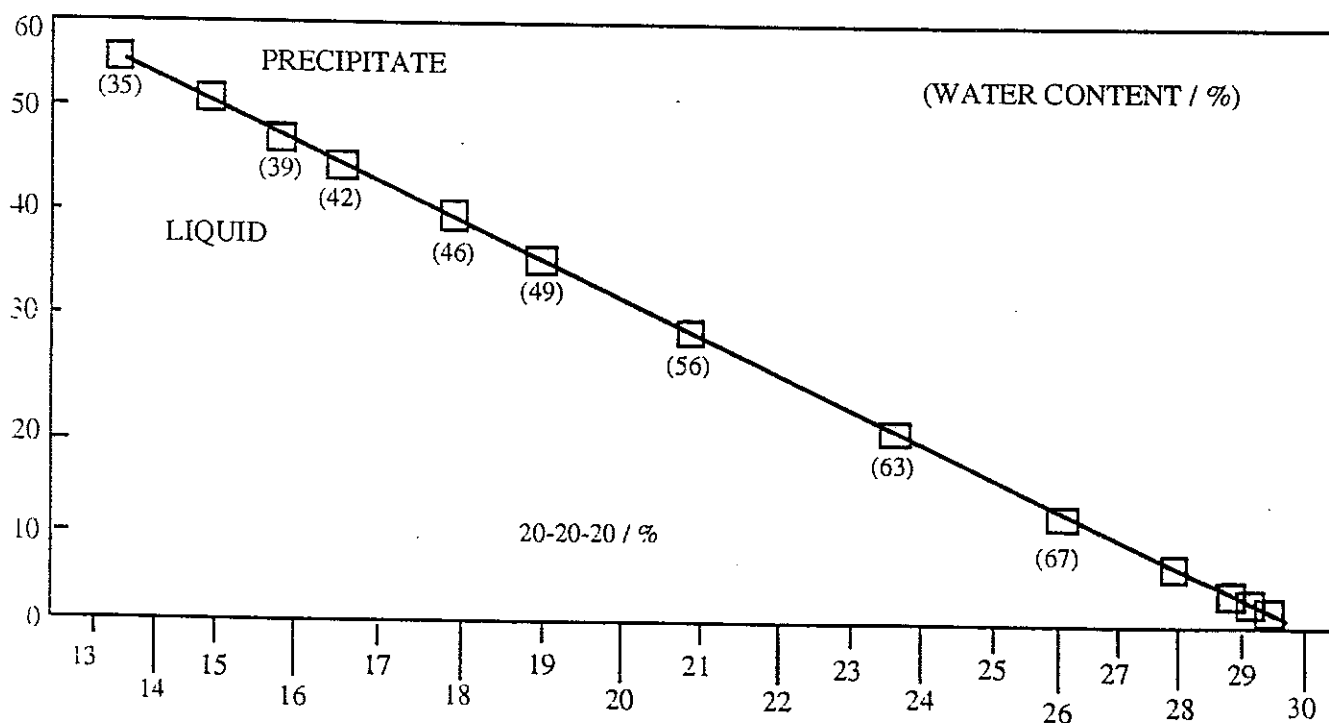
UREA PHOSPHATE (%)	CALCIUM NITRATE (%)	WATER (%)	
15	50	35	Precipitate
21	30	49	Precipitate
22.5	25	52.5	Precipitate
22.8	24	53.2	Precipitate
23.1	23	53.9	Liquid
23.4	22	54.9	Liquid
24	20	56	Liquid
27	10	63	Liquid
28.5	5	66.5	Liquid
29.4	2	68.6	Liquid
29.7	1	69.3	Liquid
29.9	0.5	69.6	Liquid



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30% 20-20-20 SOLUTION + CALCIUM NITRATE

<u>20-20-20</u> (%)	<u>CALCIUM NITRATE</u> (%)	<u>WATER</u> (%)	
13.5	55	31.5	Precipitate
15	50	35	Precipitate
15.6	48	36.4	Liquid
16.5	45	38.5	Liquid
18	40	42	Liquid
19.5	35	45.5	Liquid
21	30	49	Liquid
24	20	56	Liquid
27	10	63	Liquid
28.5	5	66.5	Liquid
29.4	2	68.6	Liquid
29.7	1	69.3	Liquid
29.9	0.5	69.6	Liquid



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LIDOCEM, INC.

20 Village Court, Hazlet, N.J. 07730 area code 908 888-8000—Fax No. 908 264-2751—Telex No. 4970868

October 21, 1993

Dr. Mark Kliever
Dept. Viticulture & Ecology
University of California Davis
Davis, CA 95616

Dear Mark:

Thank you for the time you spent talking with me during our recent telephone conversation.

As we discussed, Lidochem, Inc., was established in 1981 and has grown into a national distributor of fertilizer raw materials. Lidochem maintains a complete inventory of phosphates, chelates and trace elements at our warehouses throughout the United States. Our products are produced exclusively for Lidochem, Inc. (in most cases) by manufacturers in the U.S.A., Europe and Asia, many of whom have been doing so for over eleven years. We now supply many of the specialty fertilizer companies nationwide and have become an important part of the purchasing plans for many of them. We are confident we can be a reliable and money saving supplier for you as well.

On or about October 1, 1993 an exciting fertilizer raw material will become available in the United States. This product is Monopotassium Phosphate, Horticultural Grade and will be produced by Rotem Fertilizers Ltd. and distributed by Lidochem, Inc.

Rotem's patented process enables them to produce a fully soluble, free-flowing Monopotassium Phosphate without reacting Potassium with Phosphoric Acid. This dramatically reduces the production costs and allows us to market this product at just above the cost of water soluble Monoammonium Phosphate.

I have provided a short information list on the benefits of Rotem's Monopotassium Phosphate as well as information on a new product now available called Urea Phosphate. Also enclosed is a product list of the other products we currently keep in stock.

Samples, specification sheets, and technical information are readily available. We would also like to work with you to show you how we can improve your formulation with the Monopotassium Phosphate without increasing your cost of production.

I look forward to working with you and will call you again next week to answer any questions you may have.

Thank you.

Best regards,



Rob Caldwell
Sales Representative

RC/lk
Enc.

LIDOCEM, INC.

20 Village Court, Hazlet, N.J. 07730

Telephone No. 908-888-8000

Fax No. 908-264-2751

November 16, 1993

1500#
• 10 acres
1500#

Layne Wade
Kautz Farms
5490 E. Bear Creek Road
Lodi, CA 94520

Dear Layne:

Thank you for the time you spent talking with me during our recent telephone conversation.

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I have provided a short information list on the benefits of Rotem's Monopotassium Phosphate as well as information on a new product now available called Urea Phosphate. Also enclosed is a product list of the other products we currently keep in stock.

Samples, specification sheets, and technical information are readily available. We would also like to work with you to show you how we can improve your formulation with the Monopotassium Phosphate without increasing your cost of production.

I look forward to working with you and will call you again next week to answer any questions you may have.

Thank you.

Best regards,



Rob Caldwell
Sales Representative

RC/ae
Enc.

Facts about...**MONOPOTASSIUM PHOSPHATE**

- Monopotassium Phosphate is the most concentrated fertilizer (52% P_2O_5 and 34% K_2O) available and contains 100% of plant assimilable nutrients ($H_2PO_4^-$ and K^+)
- Monopotassium Phosphate is fully water soluble, virtually free of impurities and residual contaminants.
- Monopotassium Phosphate is cadmium free and very low in chlorine and sodium which makes it ideal for fertigation, especially on soil-less culture with recycled water.
- Monopotassium Phosphate has the lowest salt index among soluble fertilizing salts (8.4) which makes it ideal for foliar fertilization, and thereby reduces your potential to burn seed, seedlings or foliage.
- Monopotassium Phosphate is fully water soluble, non-hygroscopic, free-flowing with minimal dust.
- Monopotassium Phosphate is the most concentrated fertilizer raw material available enabling the fertilizer blender to produce nutrient rich fertilizers such as 20-20-20, without leaving out any micro-nutrients.
- Monopotassium Phosphate is a non-regulated raw material allowing the liquid fertilizer manufacturer to eliminate the hazard and cost of storing, transporting and handling a corrosive material such as Phosphoric Acid.
- Monopotassium Phosphate is a specialty fertilizer raw material for intensive agriculture and horticulture for vegetables, fruits and flowers in greenhouses and open fields.
- Monopotassium Phosphate yields a finished fertilizer that is less hygroscopic and more free flowing than fertilizers produced with Monoammonium Phosphate as the main ingredient.
- Monopotassium Phosphate is not hygroscopic and, if used as a replacement for Monoammonium Phosphate, will flow more easily through "form, fill and seal" equipment.
- Monopotassium Phosphate is now economically feasible to replace Monoammonium Phosphate and Potassium Nitrate in water soluble fertilizers and Phosphoric Acid in liquids.
- Rotem Fertilizer's Research and Development Laboratories have developed a proprietary process which allows Monopotassium Phosphate production to be derived from 2 basic raw materials - Phosphate rock from sedimentary deposits in the Negev Desert and Potassium Chloride. As a result, Rotem can offer Monopotassium Phosphate that meets the highest standard of purity and quality at prices normally associated with Monoammonium Phosphate.

Lidochem, Inc.**Specialty Fertilizer Division****20 Village Court, Hazlet, NJ 07730****Phone#(908) 888-8000****Fax#(908) 264-2751**

*Facts about...***UREA PHOSPHATE**

- *Urea Phosphate does not react with Calcium Nitrate so they can be used in the same solution. The Phosphate in Monoammonium Phosphate reacts with Calcium and forms insoluble phosphates.*
- Urea Phosphate prevents blocking of irrigation pipes and nozzles and disinfects the irrigation system.
- Urea Phosphate lowers the pH of solutions and, as such, improves the solubility and availability of some plant nutrients, i.e. phosphorus and micro-nutrients.
- Urea Phosphate's loss of Nitrogen by volatilization and leaching is remarkably low (0.7%) compared with Urea (21%).
- Urea Phosphate is an excellent source of water soluble Nitrogen and Phosphate (18-44-0) in circumstances where high pH or hard water is a problem.
- Urea Phosphate, in general, provides improved nutrient uptake and balance in the crop and is ideal to use when shorter growing time is of importance, especially in soil conditions with high pH.
- Urea Phosphate does not release ammonia as with some other Nitrogen sources (Urea, for example) because of the phosphoric acid in the molecules.
- Urea Phosphate will provide higher yields than Monoammonium Phosphate in hard water conditions.
- Urea Phosphate does not damage seedlings and young plants when used in right dosage.
- Urea Phosphate, when used in some lawn fertilizers, is very efficient as a moss killer by lowering the pH of nutrient solutions.
- Urea Phosphate hampers algae growth.

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UREA PHOSPHATE IN CALCIUM NITRATE SOLUTIONS

Are you delivering any Calcium Nitrate Solutions to your growers and farmers? Many fertilizer dealers are because of Calcium's value to plants during the growing cycle. If you are one of these suppliers you should know about Urea Phosphate.

Urea Phosphate is a water soluble source of Nitrogen and Phosphate (18-44-0). It is very similar to the Monoammonium Phosphate and Diammonium Phosphate but has the advantage of delivering a non-volatile form of Nitrogen (see enclosed bulletin for other benefits).

More importantly, Urea Phosphate is stable in Calcium Nitrate solutions. The Phosphate in Urea Phosphate will not "fall out" when blended with Calcium Nitrate in the same solution. You now can deliver more nutrients to your growers - on the same truck - netting you a higher profit and more efficient use of your equipment. You should also know that Urea Phosphate is not considered a hazardous material by the D.O.T.. Urea Phosphate eliminates the need to use corrosive materials for your source of "P" (such as Phosphoric Acid) and minimizes the potential hazards and liabilities associated with corrosive materials.

Should you be interested in knowing more about Urea Phosphate and its use in Calcium Nitrate solutions, please contact your Lidochem sales representative at the numbers listed below. In any event someone from our office will contact you to answer any questions you may have.

Raw Material Now In Stock
in New Jersey, Illinois and California

Phosphates**Ammonium Phosphates**

Diammonium Phosphate
Monoammonium Phosphate
Urea Phosphate
Phosphoric Acid

Potassium Phosphates

Dipotassium Phosphate
Monopotassium Phosphate
Tetrapotassium Phosphate

Calcium Phosphates

Dicalcium Phosphate
Monocalcium Phosphate
Tricalcium Phosphate

Sodium Phosphates

Sodium Tripolyphosphate
Tetrasodium Pyrophosphate

Chelates and Micronutrients**Chelating Agents**

Disodium EDTA, Powder
(Similar to Versene ® Na₂)
EDTA, Powder
(Similar to Versene ® Acid)
Tetrasodium EDTA, Powder
(Similar to Versene ® 220)
N-P-K Compatible Glucoheptonates

Micronutrients

Copper EDTA, Powder 14% Cu
Iron EDTA, Powder 13% Fe
Manganese EDTA, Powder 13% Mn
Zinc EDTA, Powder 14% Zn

Sulfates

Copper Sulfate, 25% Cu
Magnesium Sulfate, 16% MgO

Manganese Sulfate, 31% Mn
Zinc Sulfate, Monohydrate

Nitrates

Calcium Nitrate
Magnesium Nitrate

Ammonium Nitrate
Potassium Nitrate

Miscellaneous

Citric Acid
Alkyl Aryl Sulfonic Acid
Calcium Carbonate
Urea

Sulfate of Potash
Potassium Carbonate
Sodium Dodecylbenzene Sulfonate
(Similar to Ultra-Wet K ®)

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WHY USE ROTEM'S MONOPOTASSIUM PHOSPHATE?

Reason #1: Low Salt Content

The tendency of a fertilizer product to injure the seed or plant is estimated in the laboratory by testing the salt index. The higher the salt index, the higher the tendency of the product to cause injury to seed germination. Most starter fertilizer products on the market that are being recommended for placement on the seed have a salt index in the range of 40-50.

An excessively high concentration of soluble salts in the soil solution may develop an osmotic pressure of the solution exceeding that of the plant sap and cause dehydration, permanent injury, or even death of the plant. The lower the salt index, the lesser the risk of causing crop injury in periods of extreme drought or with localized placement of fertilizers.

In a nutshell, the lower the salt index, the lower the chance of burn potential. This will result in higher yields for the growers to whom you supply fertilizers.

Rotem-Amfert-Negev Fertilizers, Ltd. (Rotem), Israel is a new producer of Monopotassium Phosphate (MKP), who produces MKP via a patented and inexpensive process. Rotem's MKP has a salt index of 8.4 and, as such, has the lowest salt index of any fertilizer raw material. By formulating your water soluble and specialty liquid fertilizers with Rotem's MKP, you can significantly (and often, completely) eliminate the chloride (salt) content of your fertilizer.

When you choose Rotem's Monopotassium Phosphate as your source of "P" and "K" you choose to serve your customers better - by reducing the burn potential of your fertilizer and increasing the quality and volume of their yields.

For more information, please contact our sales office at the phone or facsimile numbers listed below.

Lidochem, Inc.
Specialty Fertilizer Division
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Phone#: (908) 888-8000 Fax#: (908) 264-2751