Try other Performance Nutrition® products:

- KaPre® Soil Amendments
- KaPre® Soy-based Fertilizers
- LidoQuest® Patented Soil Fertilizers
- NutriSmart® Patented Eco-Fertilizer
- Nutrol® Bio-Pesticide
- Pennamin® Amino Acid Nutrients
- Prudent® Patented Phosphite Fertilizers
- Vibrant® Patented Foliar Fertilizers
- Humates & Humic Acids
- Z.One Soil Amendments
- Worm Castings & Extracts

**ExAlut**

for the Remediation of

High Salt & Compacted Soils

- Restores Hydrophobic Soils
- Effectively Remediates "Salty" Soils
- Corrects Compacted Soils
- Penetrates mineralized soils

soil Surfactant
Technology at work for you

KaPre ExAlt melds the best ingredients with the best technology

KaPre ExAlt is a proprietary blend of organic acids, electrolytes and surfactants specifically formulated by LidoChem, Inc. to remediate “salty” and compacted soils in the Golf and Turf Industries.

KaPre ExAlt utilizes Advanced Fulvic Technology (AFT) to produce a unique fulvic acid, which is combined with state of the art surfactants, plant esters, and organic acids to remediate even the most stubborn turf problem areas caused by salt, compaction, mineralization, pollution, or flood and drought stress.

KaPre ExAlt Remediates Salt-Damaged Soils, Reduces Sodium Adsorption Ratio (SAR)

KaPre ExAlt works immediately upon entering the soil by releasing and chelating calcium, magnesium and other beneficial ions locked into the soil matrix. These newly released ions can readily displace sodium from clay particles making them mobile and easily flushed out of the plant root zone.

The powerful wetting and penetrating abilities of KaPre ExAlt greatly assists in flushing the free sodium ions deeper into the soil column. There they can be naturally buffered or removed through a drainage system.

Soil solutions with decreased sodium ions, but with high levels of soluble calcium and magnesium, consistently yield better SAR’s than untreated soils, regardless of soil types or conditions.

KaPre ExAlt Reduces Line and Equipment Scale

KaPre ExAlt gives the added bonus of keeping minerals soluble throughout irrigation and fluid spray equipment. Spray nozzles stay clog-free.

Continued use of KaPre ExAlt will actually clean irrigation lines and equipment revitalizing any sluggish and troublesome equipment components.

KaPre ExAlt Supports Soil Microbial Populations

KaPre ExAlt continues to improve the movement of water, air, ions, microbes, and nutrients long after application. Repeated applications of KaPre ExAlt help build beneficial soil microbial populations.

These microbes bind and/or break down a myriad of other potential soil toxins including fertilizer, herbicide and pesticide residues.

KaPre ExAlt Replaces Hazardous Mineral Acid Programs

KaPre ExAlt replaces hazardous mineral acids including hydrochloric, sulfuric, and other harsh acids used in the industry.

A regular program using KaPre ExAlt can safely and effectively eliminate the need for sulfur burners in areas forced to use sub-standard irrigation water.

KaPre ExAlt Is Very Safe and Easy to Use

KaPre ExAlt is worker friendly, non-toxic, non-phytotoxic, non-regulated, non-caustic, and virtually fool-proof for the safe use by all personnel without special certifications or governmental requirements.

Many of our nation’s farms, golf courses and sports turf rely upon municipal water sources that are of poor quality and ill-suited for sustainable crops and turf. While the water may be free of organic contaminants, the inorganic components pose the greatest potential problems for crops, turf and soils.

Salts, especially sodium chloride, build up in the soil’s upper layers wreaking havoc in the rhizosphere. These salts inhibit beneficial cation exchange and hinder water uptake by turf and plant roots.

Further compounding the problem, insoluble calcium carbonate and bicarbonates accumulate in the upper soil layers raising soil pH and further inhibiting cation exchange. Soils irrigated under these conditions can exhibit an increasingly higher pH, often as high as 8.0 to 9.0 - not exactly optimal growth conditions!

While it is well understood that various crops prefer different soil pH, almost all grasses, as examples, thrive in the slightly acidic pH. Most fescues grow best in the more acidic range of 5.5 to 6.0 while Kentucky bluegrass grows best in a soil pH closer to neutral or between 6.0 and 7.0.

The compounded problem of high soil pH with high sodium content can only yield one result for unsuspecting crop and turf managers: problems.

These problems may include:

- soil compaction
- disaggregation
- poor drainage
- plant diseases
- stressed roots
- bald spots
- discolored leaves

Performance Nutrition is leading the way in correcting these intricately related problems through an innovative ecosystem management approach.

And, since only two products are involved it is economical and easy to use.
Here are a few diagnostic tools to help identify and quantify the severity of your salt problems.

Visually, some turf will exhibit yellowing or stunted growth, sometimes with brown leaf tips, especially during stress periods when soils dry out. Particularly bad problems will yield a white, crusty coating in the soils around the base of plants.

Soils may also exhibit sodic characteristics, which include hydrophobicity, compaction, and a general lack of plant and turf vigor.

The best way to confirm salt problems is to review the most recent analytical data. Most modern lab reports present data in a usable form without the need for further calculation.

Look at the Sodium Base Saturation, the Exchangeable Sodium Percent (ESP), or the Sodium Adsorption Ratio (SAR). These can be calculated from the raw cation data as expressed in Parts per Million (ppm) or Millequivalents (MEQs).

Consult with your soil laboratory analyst or agronomic reference literature for the proper formulas and methods.

Interpreting the reports

The Exchangeable Sodium Percent (ESP) and the Sodium Base Saturation are essentially the same thing, which is the percent of cation exchange sites in the soil that are occupied by sodium.

The acceptable base saturation limit for sodium is typically considered to be 15% for most turfs in the U.S., but a preferable number is below 13%.

What does KaPre ExAlT soil amendment do?

- Remediate salt-damaged soils
- Reduce Sodium Adsorption Ratio (SAR)
- Support soil microbiology
- Reduce line and equipment scale
- Replace Hazardous Mineral Acid Programs
- Naturally buffer pH
- Reduce nitrogen loss
- Make fertilizers and maintenance chemicals more efficient
- Increase moisture content deep in the soil
- Stimulate plant growth and viability

Is KaPre ExAlT cost effective?

Yes, KaPre ExAlT is priced competitively and is used at very low rates.

KaPre ExAlT may well prove to be the most cost-effective sodium remediation product on the market.

This is a timely solution as one looks beyond the turf industries and into the world’s agricultural soils as a whole.

Salt issues are proving to be a crop’s worst enemy both in the United States and abroad.

How do I know if my turf has a salt problem?

Here’s what you need to know:

Why? This is because other problems and issues in the soil such as a high pH may accentuate salt issues in the soil causing plant stress.

Sodium levels above 15% on the exchange sites could result in soil dispersion, poor water infiltration, and even sodium toxicity to plants.

The Sodium Adsorption Ratio (SAR) expresses the sodium hazard present in a soil or water by comparing the proportion of sodium ions to that of calcium and magnesium by a simple calculation using the millequivalents of each.

An SAR below 13 is typically the most recommended guideline. However, we recommend keeping the SAR below 11-12 for reasons noted above.

The bottom line is that it is better to steer clear of threshold guidelines as it is sometimes too late to recover once the thresholds are met or crossed.

Next, look at the available calcium on the lab report. If the calcium is low according to observations or the lab report or is not at least 4 - 5 times higher than the sodium concentration, you may need to apply a good calcium source.

We recommend incorporating a soluble calcium fertilizer or a pure source of calcium, i.e. coral calcium, into your regular fertility program.

We do not recommend Gypsum very often as it is extremely slow to release ions and is commonly not pure as desired.

Last, but not least, look at the soil pH. Most turfs prefer a pH between 6.5 and 7.0. If your soil and water are significantly higher than that, then consider a correction through a long-term approach that gradually alters the soils ecosystem.

We recommend using sprayable or granule sulfur products. Elemental sulfur delivers fast and efficient pH adjustment to help free up the beneficial ions in your soil necessary for balance. This is especially important when dealing with high sodium issues.

Never use Gypsum for adjusting soil pH as it is actually a neutral substance and your net movement in pH will usually be zero.

Does KaPre ExAlT provide lasting results?

Yes, the sodium released and flushed out of the root zone will remain at bay under normal watering conditions.

In areas where continued use of substandard water is unavoidable, KaPre ExAlT should be included in a maintenance program to both help keep sodium moving and make calcium and other ions available in the solution.

Improved soil structure, drainage, and nutrient availability are just a few of the long-lasting attributes.

The benefit to microbial populations alone could last for years with a well-managed turf program.

What can I do to prevent salt problems in the future?

Follow these three easy steps:

1. Keep your calcium ions at proper available levels in the soil
2. Keep your soils pH at the optimum level for your type of crop or turf, and
3. Irrigate with pure clean water, or add labeled rates of KaPre ExAlT to your water source.

Does KaPre ExAlT help lower pH in alkaline soils?

Yes, KaPre ExAlT contains a very effective group of organic acids for lowering soil pH.

However, the recommended rates are so low, that only slight pH changes may be noted.

KaPre ExAlT is better suited to help accelerate other pH adjusting products such as KaPre Sulf-a-Spray or KaPre Sulf-A-Spread.

“October, I planted Annual Ryegrass as a cover crop in a heavily farmed field. I made the application in an attempt to build organic matter and free up nutrients as my crops have been declining from year to year. Germination was slow and after a month, I had a short struggling stand of yellow, stressed-looking Ryegrass.

Someone suggested that I had a salt problem from years of commercial fertilizers and substandard irrigation water. They suggested I try Performance Nutrition’s KaPre Exalt and gave me a small sample.

Skeptical, I sprayed the recommended amount of KaPre ExAlT on two thirds of the stand and let nature do the rest. The treated portion greened up nicely within a week and began growing much more vigorously than the untreated area.

Subsequently, we had ample rainfall, which seemed to help both sides, but the KaPre ExAlT treated area continued to grow thicker, taller, greener, and appears 100% stress free. The untreated side is stunted with yellowing and brown-tipped leaves. My next step is to treat the rest of the field, then my hay and forage pastures!”

W.L. Karney, Golliad, Texas 2010
Fulvic Extract in KaPre ExAltf

The liquid fulvic extract used in KaPre ExAltf is a highly concentrated Fulvic Acid made from only certified humates mined from verifiable humate source deposits. New technology takes this specialized natural ore material through a multi-step process capable of producing a highly active liquid solution which is an integral part of our KaPre ExAltf blend.

Since Fulvic Acid is such a widely, but misunderstood, term in today’s Ag & Turf Industries, we think it is important to offer this brief tutorial as well as outline some of the potential benefits.

Fulvic Acid General Information:

Fulvic Acid is a natural organic polymer extracted in very small quantities from soil humus, ocean sediment, or aquatic environments. The name “fulvic” is derived from the Latin word fulvus, because of its gem-like yellow or yellow-gold color in single-concentration form.

The average chemical formula of Fulvic Acid in KaPre ExAltf is (C₁₃₃H₋₂₋₂O₉₋₆N₂₋₅S₂) with a variation expressed below.

![Diagram of Fulvic Acid formula]

The structure of Fulvic Acid is characterized as an assembly of aromatic organic polymers with many carboxyl (COOH) groups that release hydrogen ions. The resulting species exhibit charged electrical sites making it reactive with elemental ions, especially positive metal ions. It therefore forms strong complexes with Fe³⁺, Ca²⁺, and Cu²⁺, and other soil minerals increasing their solubility and bioavailability in both soil and water.

Fulvic acids then become individually unique molecules or multi-mineral compounds that plants, and animals, absorb, assimilate and utilize to support growth and health. Additionally, the Fulvic Acid in KaPre ExAltf is extracted from naturally occurring ancient Humate deposits that are rich in a multitude of trace elements not typically found in modern soils. All of the elements available to plants eons ago when soils were in a fresh un-leached state are available in these deposits, our liquid Fulvic Extract, and ultimately in KaPre ExAltf.

Additionally, the Fulvic Extract used in KaPre ExAltf is derived from humate deposits located, mined and processed within the USA. These humate deposits are a verified source of naturally occurring Humic and Fulvic Acids of very high quality. We never use low-grade coal, lignite, or any sub-standard ores.

Where “humic” and “fulvic” are concerned, all that glitters is not necessarily gold.

KaPre ExAltf’s Fulvic Extract is...

- All-natural and organic with no hazardous substances or synthesized materials.
- Nature’s most powerful organic electrolyte.
- Highly bio-active and bio-available to microorganisms, plants, and animals.
- A potent, natural chelating agent, making elements readily absorbable and bio-available.
- A low molecular weight humate enabling fulvic-chelated minerals quick absorption into plant cells.

KaPre ExAltf’s Fulvic Extract’s Impact on Plants. Applications can...

- Dissolve minerals and trace elements and increases soluble ions in soils.
- Detoxify many pollutants in the soil and assist in the rapid breakdown of the toxins.
- Nourish microorganisms in the soil and near-root zone.
- Increase the Cation Exchange Capacity (CEC) of the soil.
- Encourage the formation of aggregates by improving soil structure and aeration.
- Increase microorganisms in soils within days after application.
- Increase the efficiency of macro-fertilizers.
- Reduce the necessary input of Nitrogen fertilizers.
- Greatly reduce sodium toxicity by chelating salts and buffering their effect.
- Prevent nutrient loss in sandy soils and increase porosity in heavy soils.
- Reduce surface water runoff and soil erosion.
- Assist in proper stomata opening, plant transpiration and respiration.
- Increase carbohydrates therefore improving Brix levels.
- Promote the production of nucleic acids.
- Improve a plant’s ability to handle stress yielding drought protection and disease resistance.
- Increase capacity for moisture storage and help plants resist wilting.
- Directly influence enzymatic and hormonal processes necessary for healthier plants.
- Interact with sunlight to enhance photosynthesis during cloudy periods.
- Increase the permeability of plant membranes, improving the uptake of nutrients.
- Increase the Cation Exchange Capacity (CEC) at plant roots.
- Enhance cell division and elongation especially in root cells.
- Increase the survival rate in seedlings, transplants, cuttings, and grafts.
- Immediately improve leaf health rating and increases growth rate with foliar feeding.
- Increase uptake of nutrients and agro-chemicals.
### KaPre ExAlt vs. The Competition

<table>
<thead>
<tr>
<th>Product Name</th>
<th>General Description</th>
<th>Notes and Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KaPre ExAlt</strong></td>
<td>Proprietary blend of organic acids, electrolytes, and surfactants</td>
<td>The concentrated synergistic combination of active ingredients makes KaPre ExAlt the fastest wetting, quickest spreading, and most active soil remediation available. Applications improve any type of soil under a wide range of circumstances.</td>
</tr>
<tr>
<td><strong>AquaTrol’s Eximo</strong></td>
<td>Based on Syntech – “Synthetic Acid” from Environmental Manufacturing Solutions</td>
<td>Syntech has a pH of 0.5 but the producer claims it “is not an Acid” and “does not give up hydrogen”.</td>
</tr>
<tr>
<td><strong>Becker Underwood’s Sal Libre</strong></td>
<td>Quaternary Soap of Organic Carboxylic Acid and Amine</td>
<td>This has to have a radical hydrocarbon somewhere in the mix that has no perceived benefit. However, the Carboxylic part does have decent chelation ability and can effectively dissolve calcium carbonate and bicarbonate.</td>
</tr>
<tr>
<td><strong>Bio Basic Medina Ag’s Elimenate</strong></td>
<td>Quaternary Soap of Organic Carboxylic Acid and Amine</td>
<td>(see same above)</td>
</tr>
<tr>
<td><strong>Solu-Cal, USA’s XSODIS</strong></td>
<td>PHCA Technology (Poly-Hydroxy-Carboxylic-Acids)</td>
<td>Carboxylic Acids alone (acetic, formic, citric) have the ability to chelate minerals, dissolve calcium and bicarbonates and help keep them in solution, but they do not offer to make them bio-available in plants and does not offer the numerous benefits of Fulvic Acid. Some wetting and penetrating improvements to water may be noted.</td>
</tr>
</tbody>
</table>

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### Case Study, Annual Ryegrass:

Right side - KaPre ExAlt was applied at labeled rates four (4) weeks after planting.

Untreated Annual Ryegrass Planted 10 Weeks Ago

Left Untreated

KaPre ExAlt Annual Ryegrass Planted 10 Weeks Ago

Treated with KaPre ExAlt 6 Weeks Ago
SALT REMEDIATION & ADJUSTMENT OF HIGH PH SOILS with KAPre PRODUCTS

The Role of KaPre Sulf-a-Spray and KaPre Sulf-a-Spread

KaPre Sulf-a-Spray and Sulf-a-Spread products address the problem of high soil pH affecting our farmlands, sports turf and golf courses - the result of excessive salts, calcium carbonate and/or bicarbonate.

Years of high-salt fertilizer, pesticide, and herbicide applications, and, less-than-desirable irrigation water can leave farmland, and sports turf substrates in a high pH condition. Unfortunately, most crops and turf require a neutral to slightly acidic pH.

High pH conditions greatly reduce the exchange capacity of vital nutrients, and, make soils incapable of releasing or flushing harmful ions and contaminants through the soil profile. These contaminants, including sodium, organic toxins, chemical salts and residues from poor water quality irrigation, become trapped in the upper soil layers.

Turf and production crops become stressed, more susceptible to disease, show signs of chlorosis, and can leave growers and turf managers combating a multitude of symptoms without correcting the cause of the problems. Inevitably, this will lead to impossible growing conditions.

Applications of labeled rates of KaPre ExAlt can correct salty soils but the long-term viability of the soil requires a pH properly balanced for your crop or turf.

KaPre Sulf-a-Spray and Sulf-a-Spread are designed to gradually and safely adjust soil and water pH through a series of applications over time.

Synergy & Performance

First, our premier salt remediation product KaPre ExAlt is an exceptional tool for immediately increasing cation exchange in troubled soils, releasing calcium and magnesium into, and flushing sodium out of, the root zone.

Second, Performance Nutrition offers two highly soluble forms of elemental sulfur - KaPre Sulf-a-Spray and KaPre Sulf-a-Spread - which lower soil pH after the sulfur is oxidized by microbial activity.

This is where the synergy of the products truly shines. KaPre ExAlt is an immediately available hydrogen source, helping to instantly lower pH in the rhizosphere where it counts.

At the same time, KaPre ExAlt activates and nourishes the microbial populations necessary for the conversion of elemental sulfur to sulfuric acid.

This one-two punch accelerates the normally slow elemental sulfur reaction in the soil and speeds the reaction for a quicker and more efficient response. Rather than waiting months to lower pH levels, effective results are evident in a matter of weeks or days, depending on the season.

Lower rates of sulfur can be used because of the synergistic response of the two products working in unison.

Note: Microbial activity is temperature dependent, so applications during colder seasons will provide slower, although still effective, results.

KaPre Sulf-a-Spray is a 90% sulfur suspendable micronized sulfur preparation, which is easily suspended for spray applications or for distribution through irrigation/ fertigation systems.

KaPre Sulf-a-Spread is an equally effective granular application that can be mixed with virtually any common dry fertilizers.

Product Stewardship; Key to success!

It is important to use KaPre Sulf-a-Spray and KaPre Sulf-a-Spread properly.

See Table 1, which details the total weight of KaPre Sulf-a-Spray or KaPre Sulf-a-Spread required to move a pH to and from different pH levels using them as the only pH adjustment tool.

See Table 2, which details the total weight of KaPre Sulf-a-Spray or KaPre Sulf-a-Spread required to move a pH to and from different pH levels when used in a program with KaPre ExAlt.

It is important to note that the weights listed are the accumulation of the weights of product in several applications made over an extended period.

- Do NOT apply the “total weight” during a single application event as sulfur can be damaging to a plants leafy tissues and roots at excessive rates.
- Soil pH adjustments with elemental sulfur should be accomplished slowly over time with periodic soil sampling and analysis for monitoring purposes.
- Do NOT apply more than 150 lbs. of KaPre “Sulf-a-” products per acre (3.5 lbs/1000 sq. ft.) per application on farms, gardens or long cut grasses, such as fairways and lawns.
- Do NOT apply more than 0.35 lbs/ 1000 sq. ft. of either KaPre “Sulf-a-” product on sensitive crops or short-cut grass, such as greens and tees (15lbs/acre).
- Separate applications by at least 30 days during warm months and 60 days during cooler months.

Table 1. Pounds of KaPre Sulf-a-Spray or KaPre Sulf-a-Spread

Required to Decrease Soil pH to a Depth of 4-8 Inches.

<table>
<thead>
<tr>
<th>Desired pH Change</th>
<th>Total Pounds of KaPre Sulf-a-Spray or Sulf-a-Spread Required per Acre Based on Soil Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sand</td>
</tr>
<tr>
<td>9.0 to 6.5</td>
<td>450</td>
</tr>
<tr>
<td>8.5 to 6.5</td>
<td>375</td>
</tr>
<tr>
<td>8.0 to 6.5</td>
<td>300</td>
</tr>
<tr>
<td>7.5 to 6.5</td>
<td>225</td>
</tr>
<tr>
<td>7.0 to 6.5</td>
<td>150</td>
</tr>
</tbody>
</table>

Table 2: Pounds of KaPre Sulf-a-Spray or KaPre Sulf-a-Spread Required

To Decrease Soil pH to a Depth of 4-8 Inches.

When Used with KaPre ExAlt at Labeled Rates and Timing

<table>
<thead>
<tr>
<th>Desired pH Change</th>
<th>Total Pounds of KaPre Sulf-a-Spray or Sulf-a-Spread Required per Acre Based on Soil Type</th>
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<tr>
<td></td>
<td>Sand</td>
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<tr>
<td>9.0 to 6.5</td>
<td>300</td>
</tr>
<tr>
<td>8.5 to 6.5</td>
<td>250</td>
</tr>
<tr>
<td>8.0 to 6.5</td>
<td>200</td>
</tr>
<tr>
<td>7.5 to 6.5</td>
<td>150</td>
</tr>
<tr>
<td>7.0 to 6.5</td>
<td>100</td>
</tr>
</tbody>
</table>

Maintaining the proper pH Levels

Upon reaching the desired pH range, one option would be to stop treatments until monitoring indicates otherwise.

The other option, which we recommend, is to begin a cost-effective maintenance program using regularly scheduled KaPre ExAlt applications at labeled rates and timing as a way of minimizing future pH adjustments.

KaPre ExAlt applications will also keep salt problems at bay indefinitely.

This approach is an ecosystem-friendly approach that avoids large swings in pH levels.