



# LIQUIDS FOR NITROGEN FERTILITY

Nut Trees- Apples - Pears - Berries - Row Crops - Cotton - Citrus - Stone Fruit

Growth Products' liquid slow release nitrogen and high potassium fertilizer solutions are both specifically formulated for use on agricultural crops.

**Nitro-30 SRN (30-0-0) with 85% Slow Release Nitrogen and Nitro+K 22-0-16**

These products are extremely stable, crystal-clear liquid solutions and have extremely low salt indexes (phytotoxicity). There is the additional benefit of safety in handling since they are neither hazardous or corrosive.

When foliarly applied, Nitro-30 has performed with impressive results. Independent studies have shown that it can increase crop yield 40 to 60%, as well as dramatically improving fruit size and quality.

## OUR HISTORY PROVIDES ASSURANCE

Growth Products has been manufacturing liquid slow release nitrogen fertilizers for more than 20 years. Our research began in the late 70s, and has resulted in two highly reliable and environmentally sound products for agriculture. Nitro-30 had its beginnings in the early 80s, and for the year 2000, Growth Products has expanded its agricultural fertilizer line with the advent of new Nitro+K (22-0-16). Nitro+K combines the benefits of slow release nitrogen and the safest and most soluble potassium source (potassium carbonate).

## WHAT ARE NITRO-30 SRN AND NITRO+K?

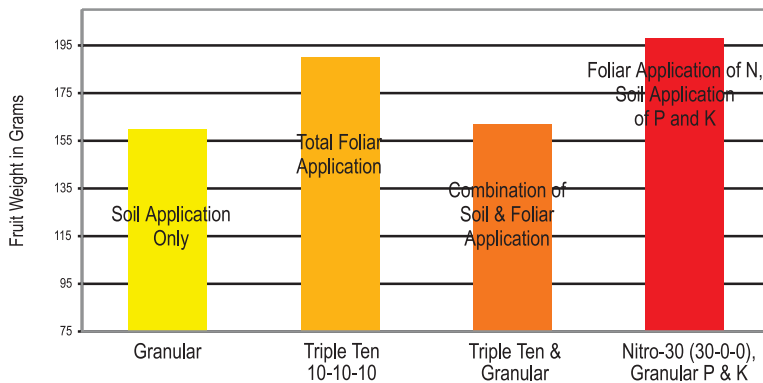
Nitro-30 and Nitro+K are crystal-clear solutions containing a unique slow release methylene urea nitrogen molecule. The methylene urea molecule is created through a special manufacturing process that utilizes UF chemistry. The proprietary chemistry leading to Nitro-30's formulation makes it the highest slow release source -- and the most stable concentrated liquid nitrogen product. It also has the lowest salt index of any nitrogen source. It requires



*Proper potassium nutrition is essential for high yields, and managing K levels correctly requires attention throughout the growing season. During boll development, the cotton plant may take up K at a rate of 2 to 3 pounds per day. As a result, when K is in short supply, the boll will out-compete any new growth. Cotton is extremely sensitive to low availability of K in the soil. In fact, it is even more sensitive than corn, soybean, or wheat. Foliar applications of Nitro+K will help to resolve such deficiencies.*

Slow Release Nitrogen For Foliar Nutrition, Hamlin Orange Trees

University of Florida Citrus Research Center, 1997



*Data from Florida's Citrus Research Center has provided intriguing evidence demonstrating that a slow, consistent foliar application of nitrogen improves the uptake of potassium. For two consecutive years, tissue analyses on 6-month old spring flush leaves were found to show considerable increases in potassium levels as a result of foliar nitrogen applications.*

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no special handling, is not affected by high temperatures, and possesses a prolonged shelf life of more than two years. Nitro+K also has the added benefit of a safe potassium source, without any chlorides or sulfates.

### WHAT ARE THE RELEASE MECHANISMS FOR NITRO-30 AND NITRO+K?

When applied as foliar sprays, Nitro-30 and Nitro+K coat the leaf tissue with a glossy clear film that lasts for weeks. It also penetrates the waxy layer of any leaf tissue. Nitro-30's molecule is held together by a strong methylene bond (CH<sub>2</sub>) that will not release all of the nitrogen at once, but rather must be broken down one bond at a time. These properties allow the nitrogen to be slowly released through the effects of heat, hydrolysis, microbial activity, and UV radiation. K absorption through leaf tissue is greatly enhanced by means of this stickiness. University studies show a 72%

*Studies have shown that foliar application of macronutrients like nitrogen and potassium are critical for plant health and each stage of fruit production. Nitro-30 and Nitro+K may be safely applied during all stages of growth, including pre-bloom, pink bud, king bloom, full bloom, and early nut.*



increase in K in leaf tissue when Nitro-30 is used.

### WHY DOESN'T NITRO-30 LEACH OR VOLATILIZE?

Nitro-30 is extremely sticky, and as it dries, it forms a coating on leaf and/or soil particles. This coating is impermeable to excessive rains or watering and will remain on the leaf or in the soil for future absorption. There is the added benefit that N-30 also acts as a sticker/spreader and increase the adhesion of other technical materials .

According to the old adage, "A chain is only as strong as its weakest link." And the strong links that make up the Nitro-30 molecule ensure that it will not volatilize. It is not affected by excessive heat, and therefore remains exactly where you put it. This translates into greater efficiency (and less waste), since it reduces the amount of nitrogen needed -- while getting even better results.

### TRIED AND TRUE

Field trials conducted by leading universities in the US and Europe show a residual nitrogen release of up to five weeks on the leaf tissue. These tests were conducted on major crops (such as citrus, apples, grapes, and hops) and continued use on a broad variety of row crops (such as lettuce, spinach, broccoli, cantaloupes, celery, parsley, and tomatoes). Nitro-30 also improves leaf absorption of potassium and other nutrients. Field studies in Florida by large growers show a 60% increase in plant growth for parsley (weight) when Nitro-30 was applied with a

*In order to avoid the problem of over fertilization, slow release nitrogen (SRN) should be utilized. Over fertilization causes excessive vegetative growth and increases losses from frost, plant stress, and foliar disease in berry crops.*



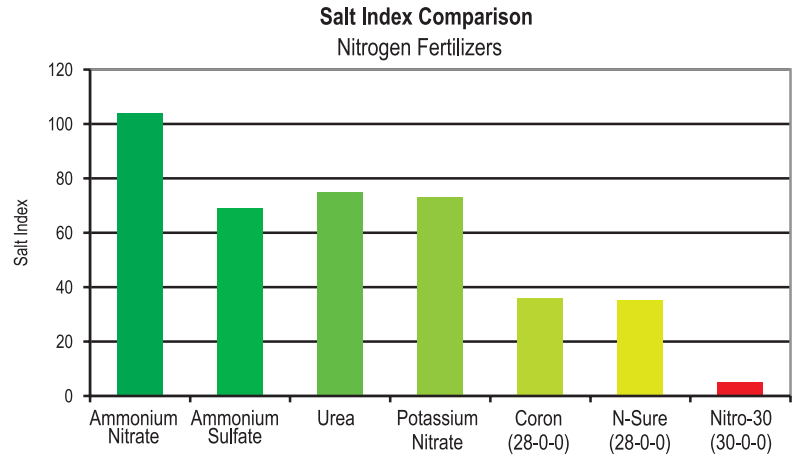
*Yield from leafy crops like spinach can be significantly increased by foliar applications of Nitro-30. Best of all, by utilizing foliar methods, these increases can be accomplished while reducing soil nitrogen levels by as much as 30%.*

plant growth regulator. Its performance over urea and PGRs alone was 39% to 46% greater.

### AGRONOMICS AND ECONOMICS CAN GO HAND-IN-HAND.

Crop yield and cost are two major considerations for the farmer. With quick release nitrogen sources, an average of 25% to 40% is lost via volatilization, leaching to below the root zone, and general run off into waterways. Unlike quick release nitrogen sources, Nitro-30 and Nitro+K will not volatilize. They are

The salt index levels of 7 nitrogen fertilizers are compared in the following chart. Nitro-30 was found to have the lowest salt index of any agricultural fertilizer. Salt index is determined by measuring the electrical conductivity of the fertilizer in a solution. Products with higher salt indexes have an increased tendency towards plant injury and reduced germination. In the soil, salts reduce the amount of water available to seeds and roots. This chart compares several sources of N including other commercially available products. In addition, Nitro+K (22-0-16) has the lowest salt index of any potassium source. When compared to Potassium Thiosulfate (KTS), Nitro+K has a 33% lower salt index.



naturally sticky, and will adhere to even the waxiest leaf tissue, so they are available for consistent release for up to 5 weeks. Unlike quick release nitrogen sources that are absorbed within a 48-hour period, there is no short, spiked increase of nitrogen.

In an on going five-year study at the University of Florida, foliar nitrogen applications with Nitro-30 and N+ K were compared to ground applied granular nitrogen fertilizer - and Nitro-30 produced a 38 gram increase in fruit size, which significantly increases profits. "This is quite a significant finding because in the fresh fruit industry large fruits give premium dollars". Larger fruit increases profits far more than the additional cost per acre. Both Nitro-30 and Nitro+K have a low biuret content and can be safely used on citrus which is highly sensitive to biuret toxicity.

A three-year study was also conducted by the Research Institute for

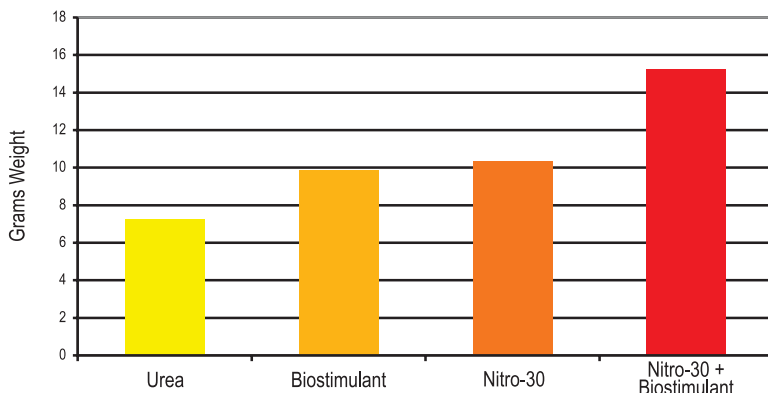
Agriculture, Viniculture And Horticultural Graduate School (SLVA) in Germany on Riesling Klon 21 W grapes. The results indicate that a higher nitrogen level can be maintained through foliar applications of Nitro-30 than with granular soil applications -- even during the '97 heavy rains. Nitrogen deficiencies could also be corrected by "leaf fertilizing."

In Europe, foliar applications of nitrogen are necessary as a result of strict government laws restricting soil nitrate levels. Our earliest products have been used in Europe for 10 years for foliar crop applications. The Nitro family of products provides the farmer with the ability to add nitrogen to crops when granular products are ineffective, impossible to apply, or restricted. With granular products, nitrogen is often leached below root levels by heavy rains or lost through run-off.



Legislation and public concern over nitrate contamination of groundwater in citrus growing regions have spurred researchers to work on developing BMPs without adversely impacting the economics of production.

Florida Grower Parsley Yield Study, 1999  
Average Weight For Two Harvests



Growers in Florida are faced with increasing concern about loading of nitrates into groundwater. Following the 1994 N-BMP legislation, improved N-management practices can only be considered BMP if it decreases the NO<sub>3</sub>-N leaching. The parsley study conducted by a leading vegetable grower confirms that foliar applications of Nitro-30 improved the economics of production by reducing the amount of N applied to 1/3 the rate of urea. Nitro-30 was applied at 3 lbs. of N / acre versus 9.2 lbs N of urea. Parsley grown with Nitro-30 had an increased yield of 39% the first cutting and 46% the second cutting. In combination with 3 oz. rate of a biostimulant the crop yield was increased 89% over urea. Confirming the sticker properties of Nitro-30.



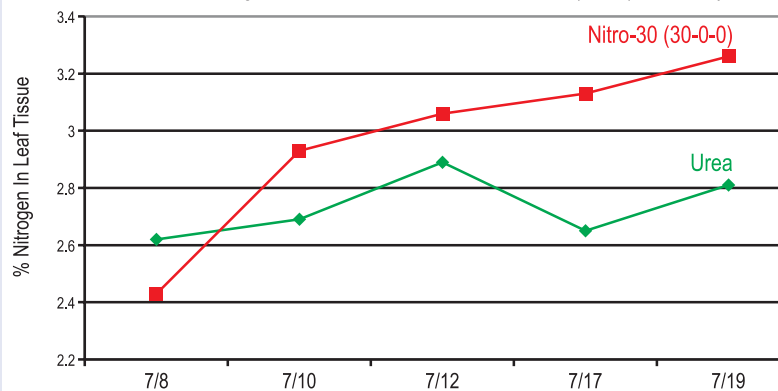
*New methods for the cultural practices of grapes require continuous field monitoring of tissue samples. The ability maintain and quickly correct the amount of nitrogen throughout the crop cycle is extremely important. Since grapes are very sensitive to burn, Nitro-30 provides a safe and reliable nitrogen source for foliar applications.*

## BENEFITS OF THE NITRO FAMILY OF PRODUCTS:

- Can be foliarly applied at any time to quickly correct N and K deficiencies.
- Lowest salt index of any liquid nitrogen source.
- Provide the ability for low volume spraying because of its low phytotoxicity.
- Can be applied with pin point accuracy.
- Unique sticker / spreader properties.
- Will not leach into groundwater.
- Does not volatilize.
- Compatible with most crop protection chemicals.
- Made from 100% low biuret urea.
- Contain no chlorides.
- Meet strict State of Washington Standards for heavy metals.
- Will not leave heavy deposits in tanks.
- Are 100% miscible in water.
- Contain carbon to feed soil microbes.
- Do not require any special handling.
- Extremely stable.
- Non-hazardous.
- No crystallization will not occur on leaf tissue.
- Will not revert back to a urea or ammoniacal form.
- Made from only the most superior raw materials.
- Can be spray-applied along with other technical materials.
- Lowest salt index of any potassium source.
- Contain no nitrates.

### Foliar Fertilizer Study - Reisling Grapes, 1996

State Teaching & Research Institute For Viniculture (SLVA), Germany



*A three-year study conducted by The German State Teaching and Research Institute for Agriculture, Viniculture, and Horticulture confirms that Nitro-30 adheres to the leaf and that "nitrogen deficiencies can be corrected by Nitro-30 leaf fertilization". Nitro-30 was applied at less than 1/2 the soil rates, or 7.7 lbs. of N per acre versus 16 lbs per acre of urea. Despite the reduction in the nitrogen rate, "Nitro-30 in comparison to urea, the nitrogen content in the leaf tissue were on average higher and this was the case in all test phases for all three years". The three year trial led to the official recommendation for the use of Nitro-30 SRN by the Central Research Station for Viniculture on Riesling grapes in the Moselle River region.*

*European fruit studies indicate that by applying Nitro-30 four times per year (at .75 to 1 gallon per acre; equivalent to 2.7 lbs. per acre), researchers were able to increase fruit yield by 15.5% and fruit diameter by 7-8% (to 80-85 mm).*

