

Professional Plant Food Grower's Guide



Table of Contents

Nature's Source Formulation

- Nutrition
- Conductivity (EC)

Use with Acids

Injector Instructions

- Direct from Container
- Stock Tank/Injector Ratios
- Tank Mix without Injector

Line Sanitation Practices

- Common Factors
- Irrigation Water
- Line Configuration

10-4-3

GUARANTEED MINIMUM ANALYSIS

Total Nitrogen (N).....	10%
Available Phosphate (P ₂ O ₅).....	4%
Soluble Potash (K ₂ O).....	3%
Calcium (Ca).....	0.01%
Magnesium (Mg).....	0.05%
Sulphur (S).....	0.02%
Boron (B).....	0.002%
Copper (Cu)	0.001%
Iron (Fe).....	0.01%
Manganese (Mn).....	0.005%
Molybdenum (Mo)	0.0001%
Zinc (Zn).....	0.004%

Ingredients List: Oilseed Extract, Monopotassium Phosphate, Potassium Sulfate, Ammonium Phosphate, Sulfate of Ammonia, Ammonium Nitrate, Urea.

Potential Acidity: 163.75kg (361 lbs.) Calcium carbonate equivalent per ton.

Nutrition

Nitrogen Comparison

Nature's Source is a **liquid** plant food. It contains **oilseed extract**, a natural source of plant nutrition. When comparing the amount of nitrogen in Nature's Source 10-4-3 to a water-soluble fertilizer, one must make the comparison based on weight. Example:

Nature's Source 10-4-3 container

- One container 17.8L (4.7 US gal) = 21.3kg (47lbs)
- 10% Nitrogen
- Provides 2.13kg (4.7lbs) of N

Dry 20-10-20 bag

- One Bag = 11.3kg (25lbs)
- 20% Nitrogen
- Provides 2.3kg (5lbs) of N

Although Nature's Source is 10% nitrogen, it is twice the weight. Therefore, one container of Nature's Source will yield virtually the same amount of nitrogen when compared to one bag of water-soluble 20% nitrogen fertilizer.

Other Nutrients

Nature's Source is an all-purpose plant food providing essential N-P-K, calcium, magnesium, plus micronutrients. Sustainable nutrition is derived from oilseed extract (see label). Research done by Dr. Paul Nelson at North Carolina State University concluded that Nature's Source is "adequate to meet the requirements" for most bedding crops when compared to salt based fertilizers.

Sustainable nutrition:

Nature's Source is a liquid plant food that contains oilseed extract, a natural source of plant nutrition. It is normal for Nature's Source concentrate to have color variation. Each batch is tested for formulation accuracy.

High Greenhouses Inc.



55431 RR 262
Sturgeon County, AB
T8R 0W7

Ph: 780-939-7490 Fax: 780-939-2010

www.highgreenhouses.com

Conductivity

Nature's Source has a lower EC (electrical conductivity) relative to other commonly used fertilizers.* Lower EC levels can reduce the likelihood of salt burn and decrease the need to leach.

*See chart below for Nature's Source 10-4-3 EC levels compared to water soluble formulations at various ppm rates.

Lower EC:

- Reduces chance of salt burn.
- Reduces build-up of salt in the growing media.
- Helps offset total salt level from current water.

Conductivity Chart

This chart is provided as a reference to verify the accuracy of fertilizer injectors PPM Nitrogen. EC variance +/- 10%. Concentration-Conductivity in Millimhos (mmhos) or MilliSiemens (mS)

Formulation	100 ppm	125 ppm	150 ppm	200 ppm	250 ppm	300 ppm	400 ppm	500 ppm	600 ppm
Nature's Source 10-4-3 EC	0.38	0.48	0.57	0.76	0.95	1.14	1.52	1.85	2.28
Generic 20-10-20 EC	0.62	0.78	0.93	1.24	1.55	1.86	2.48	3.10	3.72
Generic 15-5-15 EC	0.69	0.87	1.05	1.38	1.74	2.07	2.76	3.45	4.14

Use with Acids

When mixed as directed, Nature's Source is compatible with most acids used by professional growers.

- **Sulfuric Acid:** Nature's Source may be mixed with acid in the same stock tank as long as the acid has been diluted with water prior to adding Nature's Source. DO NOT mix acids or Nature's Source together in their concentrate forms. Sulfuric acid is an extremely strong oxidizer and can denature the organic compounds in Nature's Source if mixed in concentrated form.
- **Phosphoric acid:** Although not as strong, it is still recommended to be diluted with water prior to adding Nature's Source. Both Sulfuric acid and Phosphoric acid may also be used with Nature's Source with separate injection lines.
- **Organic Acids/Citric Acid:** Refrain from using citric acid or other organic acids with Nature's Source 10-4-3. Mixing an organic acid with Nature's Source can result in increased microbial growth.

Important:

- Dilute acids before combining with Nature's Source.

Direct from Container

Pulling directly from the Nature's Source container is a convenient method of application for the 10-4-3 formula, as it maximizes shelf life and ease of use by eliminating the need to create a stock tank solution. See chart for injector settings and corresponding parts per million.

Direct from container:

- Eliminates mixing stock solutions
- Maximizes shelf life

Injecting Directly from the Nature's Source Container

	250 ppm	300 ppm	400 ppm	500 ppm	600 ppm
Injector Ratio	1:500	1:400	1:300	1:250	1:200

Stock Tank/Injector Ratios

Three factors must be known when determining how much Nature's Source to add to the stock tank:

- Desired application rate (ppm)
- Injector ratio
- Size of the stock tank

Once determined, refer to the Nature's Source Injector Ratio Chart (right). This chart is also located on the back label of each product container. The chart shows how many millilitres of Nature's Source should be added per litre of the stock solution at various injector ratio/ppm combinations.

Multiply the number of millilitres per litre times the size of the stock tank to get the total millilitres of Nature's Source needed to prepare the stock solution.

Example: A grower wants to fertilize at a rate of 200 ppm, an injector rate of 1:100, and has a 20 litre stock tank.

The chart at right reflects this example, showing that the grower will need 166.7 ml of Nature's Source to make 1 litre of stock solution. So:

166.7 ml/litre x 20 (stock tank size) = 3,334 ml or 3.33 litres of Nature's Source needed to make 20 litres of stock solution at a 1:100 ratio with 200 ppm out the end of the hose.

Tank Mixing

Nature's Source can be used without an injector by tank mixing. The size of the tank and desired ppm are needed to determine the millilitres of Nature's Source per litre of water. The Tank Mix Chart (right) shows the millilitres of Nature's Source needed for different ppm rates and tank sizes.

Example: A grower wants to fertilize using a rate of 200 ppm, has a 200 litre tank, but does not have an injector.

The chart at right reflects this example, showing that the grower will need 1.72 ml of Nature's Source to make 1 litre of stock solution. So:

1.72 ml/litre x 200 (stock tank size) = 344 ml of Nature's Source needed to make 200 litres of ready-to-use fertilizer at 200 ppm.

Stock tank tips:

- When mixing, add Nature's Source to the tank first, then fill with water to appropriate level.
- When using a siphon, check to see if it is a ratio of 1:15 or 1:20 and refer to the chart below.
- The more diluted the stock tank solution, the sooner it should be used to ensure optimal performance.
- 1:100 dilution should be used in 3-5 days.

Important

The more dilute the stock tank solution the more rapidly organic growth may occur. As a preventative apply a few drops of dishwashing liquid (excluding antibacterial and all Ivory) to the top of the stock tank solution which will break the surface tension, keeping organic growth from occurring. If organic growth does occur it will not affect the nutritional value of the plant food or harm plants.

Nature's Source Injector Ratio Chart

ml of Nature's Source To Make 1 litre of Stock Solution

Injector Ratio	ppm of N in final solution						
	125 ppm	150 ppm	200 ppm	250 ppm	300 ppm	400 ppm	500 ppm
1:15 (siphon)	15.6	18.8	25.0	31.3	37.5	50.0	62.5
1:20 (siphon)	21.0	25.4	33.8	42.2	50.6	67.6	84.4
1:100	104.2	125.0	166.7	208.3	250.0	333.3	416.7
1:128	133.4	160.0	213.3	266.7	320.0	426.7	533.3
1:200	208.4	250.0	333.3	416.7	500.0	666.7	833.3
1:300	312.5	375.0	500.0	625.0	750.0	Direct	
1:400	416.7	500.0	666.7	833.3	Direct		
1:500	520.0	625.0	833.3	Direct			
1:600	624.0	750.0	Direct				

Direct = Pulling direct from the Nature's Source container

- Nature's Source can be added to other spray applications, e.g., fungicides and insecticides, after first conducting a jar compatibility test.

Nature's Source Tank Mix Chart ml of Nature's Source

Desired ppm	per litre	per 50L	per 200L
125	1.04	52.00	208
250	2.09	104.50	418
300	2.50	125.00	500
500	4.17	208.33	834
600	5.00	250.00	1000

Line Sanitation Practices: Common Factors

Line sanitation is important to prevent biofilm and emitter clogging. Recent research at the University of Florida showed increased clogging when fertilizer was used in irrigation lines, regardless of fertilizer type. Good water line sanitation practices will reduce the risk of biofilm build-up and emitter clogging.

Irrigation Water

It is important to understand the water source and water quality before applying any fertilizer, as certain water sources have higher microorganism loads. Do the following to better understand the factors:

- **Determine the source of irrigation water.** Having knowledge of where the water comes from provides insight into possible factors.
- **Test water pH.** Anything above 8.0 lowers the solubility of minerals, increasing their tendency to precipitate. Most growers with pH levels over 8 will lower their pH.
- **Conduct a water analysis test.** Tests completed at different times of the year can reveal possible variations of pH and other chemical levels. This will help in determining whether different times of the year are more favorable for clogging.

Separate Tank

Mixing Nature's Source with any line cleaning product in the same stock tank is not recommended, as it may decrease the effectiveness of Nature's Source. It is recommended to use two injectors pulling from separate tanks (see diagram to the right).

The preceding paragraph serves only as a suggestion. For professional assistance with line configuration, contact your preferred injector manufacturer.

Any questions or comments can be directed to:
Michiel Verheul Western Canadian Distributor
Michiel@highgreenhouses.com
780-939-7490

Amy McCormack - Sales & Distribution Manager -
Eastern Region
888-839-8722 Ext. 117 (office)
203-592-2636 (mobile)

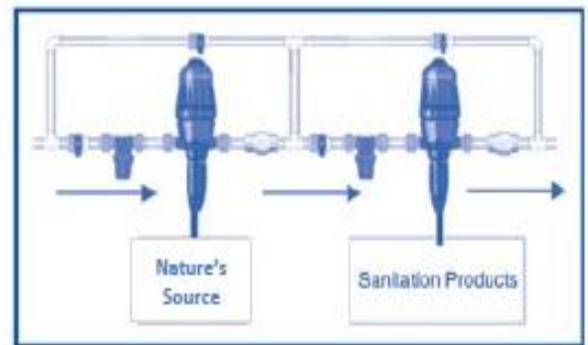
Ted Koellmann - Technical Sales Representative - NW
Region
888-839-8722 Ext. 137 (office)
503-875-0035 (mobile)

More info:

- Visit the Water Education Alliance for Horticulture website at www.watereducationalliance.org for more info on line sanitation practices and managing irrigation water.

Water & its source:

- Understanding the water source and water quality will help identify possible factors that cause emitter clogging.



Separate tanks:

- Are recommended when drawing Nature's Source and sanitation products through the same line.

High Greenhouses Inc.



Sturgeon County, AB
contact@highgreenhouses.com
www.highgreenhouses.com
780-939-7490

Manufactured Under License From: Daniels © AgroSciences, LLC
Manufactured by: Ball DPF, LLC
307 E. Mulberry Street
Sherman, TX 75090

Website: www.NaturesSourcePlantFood.com
Email: info@NS-PF.com
Phone: 888-839-8722

NATURE'S SOURCE®

