GreenCare
19-4-23
Orchid Well Water Special

Guaranteed Analysis

Total Nitrogen……..….19%
13.6% Nitrate Nitrogen
5.7% Ammoniacal Nitrogen
Available Phosphate (P_2O_5)……..….4%
Potash (K_2O)……23%
Calcium……..…….2.0%
Magnesium……..……0.0%
Iron (Fe)……...0.160%
Manganese (Mn)……..…0.080%
Zinc (Zn)……..…0.080%
Copper (Cu)……..…0.080%
Boron (B)……..…0.016%
Molybdenum (Mo)……..0.016%

Derived from : Ammonium nitrate, ammonium phosphate, boric acid, copper sulfate, iron EDTA, manganese sulfate, potassium nitrate, sodium molybdate, and zinc sulfate

Potential Acidity: 140 lbs. Calcium carbonate equivalent per ton.

EC chart

ppm N	50	100	125	150	200
EC	0.34	0.68	0.85	1.02	1.36

To calculate the EC of the fertilizer solution
EC of the solution from hose end - EC of irrigation water = EC of fertilizer

Mixing Instructions - U.S. Gallon

	50 ppm N	100 ppm N	125 ppm N	150 ppm N	200 ppm N
Per U.S. gallon of fertilizer	0.03 oz. (1.0 grams)	0.07 oz. (2.0 grams)	0.08 oz. (2.5 grams)	0.10 oz. (3.0 grams)	0.14 oz. (4.0 grams)
Per U.S. gallon of stock solution for 1:15 injector	0.5 oz. (15 grams)	1.0 oz. (30 grams)	1.3 oz. (37 grams)	1.5 oz. (45 grams)	2.1 oz. (60 grams)
Per U.S. gallon of stock solution for 1:100 injector	3.5 oz. (100 grams)	7.0 oz. (200 grams)	8.8 oz. (250 grams)	10.5 oz. (300 grams)	14.0 oz. (400 grams)

Greencare Fertilizers, Inc. - 2607 Eastgate Ind Pkwy. Kankakee, IL 60901
- 815-936-0096 - Fax 815-936-9247

Mixing Instructions -Imperial Gallon

	50 ppm N	100 ppm N	125 ppm N	150 ppm N	200 ppm N
Per Imp. gallon of fertilizer	0.04 oz. (1.2 grams) (0.192 tsp.)	0.08 oz. (2.4 grams) (0.384 tsp.)	0.10 oz. (3.0 grams) (0.480 tsp.)	0.12 oz. (3.6 grams) (0.576 tsp.)	0.17 oz. (4.8 grams) (0.768 tsp.)
Per Imp. gallon of stock solution for 1:15 injector	0.6 oz. (18 grams) (2.88 tsp.)	1.2 oz. (36 grams) (5.76 tsp.)	1.56 oz. (44.4 grams) (7.11 tsp.)	1.8 oz. (54 grams) (8.64 tsp.)	2.52 oz. (72 grams) (11.52 tsp.)
Per Imp. gallon of stock solution for 1:100 injector	4.2 oz. (120 grams) (19.22 tsp.)	8.41 oz. (240 grams) 38.43 tsp.)	10.57 oz. (300 grams) (48.04 tsp.)	12.61 oz. (360 grams) (57.64 tsp.)	16.81 oz. (480 grams) (76.86 tsp.)

Notes from an email from: Jan Szyren -Greenhouse Coordinator: Plant Biology Teaching Greenhouses and University Orchid Collection -Michigan State University

Bill Argo says: 12 grams fert for 5 gallons - that's about 2 level teaspoons. A level half-teaspoon per gallon would also work just fine. A little stronger than 125ppm N is desirable. If you use an injector, the correct formula follows below.

(desired ppm (125 minimum for MSU formulas) x gallons concentrate x dilution factor)
Note: if no injector is used dilution factor is 1). Divide answer to above equation by
(% Nitrogen in fert {13 or 19 with MSU fert formulas} x 1200) for POUNDS of fertilizer required

Decades of research resulted in optimum fertilizer "balance" ratios of 13:1:13:7:2:2 (Nitrogen:Phosphorus:Potassium:Calcium:Magnesium:Sulfur) This is based on extremely sophisticated studies with dozens of floriculture crops grown in peat and bark based media.
A normal 20-20-20 fertilizer has a ratio of 2.3:1:1.9, nowhere near the optimal 13:1:13 ratio. This is because the usual constituents of fertilizer are not 100% elemental. Monoammonium phosphate is chemically only 48% phosphorus and potassium nitrate is only 44% potassium.
Dr Biernbaum reports that excess phosphorus will not "harm" the plant, but is wasteful in terms of $$$ and very ecologically reckless (ground and surface water contamination)

Orchid nutrition is extremely poorly understood/studied - I gave up searching for articles years ago; after all, the MSU formula was doing very significant things here with flowers and huge new growths.... hopefully there may be additional research forthcoming as a result of potted orchid sales now being ranked # 2 in terms of sales figures in the US.

And YES, I use it year round, at least 4 out of 5 waterings. It is a self regulating system that mimics nature...plants in active growth require more water, more fert and thus get it; warmer temps and higher light in summer mean more growth, more water, more fert! And any dormant plants "resting" get little - example the Dendrobium thrysiflorum sat in a 40F greenhouse all winter...perhaps I watered it once or twice when the sun was out.

Most importantly, remember there are a host of other factors essential to good orchid culture which interact in synergy (temperature - daily fluctuations, yearly fluctuations; light - quality AND quantity; day length/photoperiod; maturity; size -(they are not the same); genetics; general health; root structure, etc. The fertilizer is not a cure all. Also, I strongly encourage growers to play with higher concentrations. I've used it at 30-40% stronger rates since spring 2003 and am again amazed. It is designed to be applied at each watering, so apply a fertilizer solution 3, 4 or 5 times and then flush with rain or RO water. Honestly, I've had zero problems with mineral build up…basically because when I water each plant is utterly deluged. For me, the RO/rain just keep the leaves and growths at their prettiest.

GreenCare

13-3-15
Orchid RO Water Special
Water Soluble Fertilizer
For Continuous Liquid Feeding Programs

Guaranteed Analysis

Total Nitrogen……..….13%
12.5% Nitrate Nitrogen
0.7% Ammoniacal Nitrogen
Available Phosphate (P_2O_3)……..….3%
Potash (K_2O)……15%
Calcium……..…….8.0%
Magnesium……..……2.0%
Iron (Fe)……...0.177%
Manganese (Mn)……..…0.088%
Zinc (Zn)……..…0.041%
Copper (Cu)……..…0.044%
Boron (B)……..…0.018%
Molybdenum (Mo)……..0.018%

Derived from : boric acid, copper sulfate, iron EDTA, manganese sulfate, potassium phosphate, potassium nitrate, sodium molybdate, and zinc sulfate

Potential Basicity: 420 lbs. calcium carbonate equivalent per ton.

EC chart

ppm N	50	100	125	150	200
EC	0.4	0.8	1.0	1.2	1.6

To calculate the EC of the fertilizer solution
EC of the solution from hose end - EC of irrigation water = EC of fertilizer

Mixing Instructions

	50 ppm N	100 ppm N	125 ppm N	150 ppm N	200 ppm N
Per U.S. gallon of fertilizer	0.05 oz. (1.4 grams)	0.10 oz. (2.8 grams)	0.12 oz. (3.6 grams)	0.15 oz. (4.3 grams)	0.20 oz. (5.7 grams)
Per U.S. gallon of stock solution for 1:15 injector	0.7 oz. (21 grams)	1.5 oz. (42 grams)	1.9 oz. (54 grams)	2.3 oz. (65 grams)	3.0 oz. (86 grams)
Per U.S. gallon of stock solution for 1:100 injector	4.9 oz. (140 grams)	9.9 oz. (280 grams)	12.7 oz. (360 grams)	15.1 oz. (430 grams)	20.0 oz. (570 grams)

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Mixing Instructions -Imperial Gallon

	50 ppm N	100 ppm N	125 ppm N	150 ppm N	200 ppm N
Per Imp. gallon of fertilizer	0.06 oz. (1.68 grams) (0.299 tsp.)	0.12 oz. (3.36 grams) (0.597 tsp.)	0.14 oz. (4.32 grams) (0.768 tsp.)	0.18 oz. (5.16 grams) (0.917 tsp.)	0.24 oz. (6.9 grams) (1.218 tsp.)
Per Imp. gallon of stock solution for 1:15 injector	0.84 oz. (25.2 grams) (4.48 tsp.)	1.8 oz. (50.4 grams) (8.97 tsp.)	2.28 oz. (64.9 grams) (11.53 tsp.)	2.76 oz. (78.1 grams) (13.88 tsp.)	3.60 oz. (103 grams) (18.36 tsp.)
Per Imp. gallon of stock solution for 1:100 injector	5.9 oz. (168 grams) (29.89 tsp.)	11.89 oz. (336 grams) 59.78 tsp.)	15.25 oz. (432 grams) (76.86 tsp.)	18.13 oz. (516 grams) (91.80 tsp.)	24.02 oz. (685 grams) (121.7 tsp.)

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